United States Court of Appeals

for the

District of Columbia Circuit

TRANSCRIPT OF RECORD

APPENDIX TO BRIEF FOR APPELLANT

UNITED STATES
COURT OF APPEALS FOR THE
DISTRICT OF COLUMBIA

FILED APR 15 1941

Joseph W. Stewart
CLERK

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA

No. 7820

746

ROBERT SEYFARTH, *Appellant*

v.

CONWAY P. COE, COMMISSIONER OF PATENTS,
Appellee

Appeal from the District Court of the United States for the District of Columbia

James H. Littlehales,
National Press Bldg.,
Washington, D. C.
Lynn A. Williams,
Benjamin F. Wupper.

Press of Byron S. Adams, Washington, D. C.

INDEX TO RECORD ON APPEAL.

DESCRIPTION

Page

Complaint 1

Defendant's answer 9

Plaintiff's Opening Statement 11

Testimony of Herbert G. Mayer—Plaintiff's witness

Direct Examination 43

Cross-examination 72

Testimony of Albert K. Bard—Plaintiff's witness

Direct Examination 73

PLAINTIFF'S EXHIBITS

Exhibit 1—File wrapper and contents of Seyfarth, et al. Application, Serial No. 121,552 103

Examiner's statement made on appeal 154

Applicant's brief on appeal to Board of Appeals 162

Decision of Board of Appeals 183

Petition for rehearing before Board of Appeals 186

Decision of Board of Appeals on petition for rehearing 189

Exhibit 2—Ainslie Patent No. 1,480,541 79

Exhibit 3—Page 212 Publication "Textiles and Clothing" by Watson 83

Exhibit 4—Cluett Patent 1,861,423 85

Exhibit 5—Cluett Patent 1,944,001 97

Memorandum relative to identity of defendant's exhibits 195

DEFENDANT'S EXHIBITS

Page

Exhibit A—Ainslie Patent No. 1,480,541 79

Exhibit A-1—Cluett Patent 1,861,423 85

Exhibit B—Page 212 Publication "Textiles and Clothing" by Watson 83

Exhibit C—Drawing of Seyfarth Patent Application.. 151

Exhibit D—Examiner's Statement Made on Appeal... 154

Exhibit E—Decision of Board of Appeals 183

Exhibit F—Decision of Board of Appeals on Petition for Rehearing 189

Plaintiff's Proposed Findings of Fact and Conclusions of law 195

Findings of Fact and Conclusions of Law 202

Judgment 208

Notice of Appeal 209

Statement of Points to be Relied upon in the Appeal .. 209

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA

No. 7820.

ROBERT SEYFARTH, *Appellant*

v.

CONWAY P. COE, COMMISSIONER OF PATENTS,
Appellee

Appeal from the District Court of the United States for the District of Columbia

APPENDIX TO BRIEF FOR APPELLANT

I.

PLEADINGS, DOCKET ENTRIES AND OTHER PAPERS DESIGNATED BY APPELLANT.

1 *Complaint*

(Issuance of Letters Patent prayed)

Plaintiff, for complaint against defendant, alleges as follows:

(1) Plaintiff, Robert Seyfarth, is a citizen of the United States and of the State of Illinois, residing at Highland Park, in the County of Lake, and State of Illinois.

(2) Defendant, Honorable Conway P. Coe, is a citizen of the United States, holding the official position of Commissioner of Patents in the Government of the United States and having his official residence within this district in the City of Washington and the District of Columbia.

(3) This court has jurisdiction by reason of the fact that this is a suit in equity arising under the patent laws of the United States, Section 4915 of the Revised Statutes.

(4) Heretofore, and on and prior to January 21, 1937,
Herbert G. Mayer, a citizen of the United States and of the
State of Illinois, residing at Glencoe in the County of Cook
and State of Illinois, and the plaintiff, Robert Seyfarth,
were the original, first and joint inventors of cer-
2 tain new and useful improvements in METHOD OF
MAKING CLOTHING described and claimed in the
hereinafter mentioned application for Letters Patent of the United States, which said invention was not known or used before their invention or discovery thereof, or patented or described in any printed publication in the United States or any foreign country before their invention or discovery thereof, or more than two years prior to the said application for United States Letters Patent, and not in public use or on sale in this country for more than two years prior to the hereinafter mentioned application for United States Letters Patent, and the said invention has not been patented in any country foreign to the United States on an application filed by them or their legal representatives or assigns more than twelve months prior to the said application for Letters Patent of the United States, and no application for patent on said invention has been filed in any foreign country, nor has the invention been abandoned.

(5) On or about Jauary 19, 1937, Herbert G. Mayer, and the plaintiff, Robert Seyfarth, being then the joint owners of the entire right, title and interest in and to the above-mentioned invention for improvements in Method of Making Clothing did, on January 19, 1937, by written assignment duly recorded in the United States Patent Office, sell, assign and transfer unto Reliance Manufacturing Company,

a corporation organized and existing under and by virtue of the laws of the State of Illinois, and having an office at 212 West Monroe Street, in Chicago, Illinois, the entire right, title and interest in and to said invention.

3 (6) On or about January 4, 1939, the said Reliance Manufacturing Company, being then the owner of the entire right, title and interest in and to the said invention and in and to an application for Letters Patent theretofore filed thereon in the United States Patent Office did, by assignment duly executed on its behalf by its properly authorized officers and thereafter recorded in the United States Patent Office, assign, sell and transfer its entire right, title and interest in and to the said invention and in and to the application for Letters Patent theretofore filed thereon unto the plaintiff, Robert Seyfarth, who since that time has been and now is the sole owner of the entire right, title and interest in and to the said invention and in and to the said application for patent filed thereon.

(7) On or about January 21, 1937, the said Reliance Manufacturing Company, as the owner of the entire right, title and interest in and to the above-mentioned invention, made application in the name of the joint inventors, Herbert G. Mayer and Robert Seyfarth, to the Commissioner of Patents for Letters Patent of the United States for new and useful improvements in Method of Making Clothing, which said application was given Serial No. 121,552 by the Patent Office.

(8) The invention as practiced, and as described in the specification of the aforesaid application, pertains to a method of manufacturing cotton work shirts including a number of steps which are performed in the following order: (1) a measured sample cut from each lot of piece goods from which the shirts are to be made is thoroughly wetted to secure substantially complete shrinkage; (2) the shrunk sample is measured to determine the percentage of shrinkage in both the warp and weft directions; (3) patterns of shape and size conforming to the shapes and sizes the pieces are to have in the finished shirt are utilized as guides

for the making of working patterns, the latter be-
4 ing individual to the particular lot of goods and being
of increased dimensions both in the direction of the warp and weft to pre-compensate respectively for the warp and weft shrinkage of the particular lot of goods determined by the shrinkage of the sample; (4) the various pieces are then cut from the lot of piece goods using the working patterns; (5) the pieces are then sewed together to form the shirt; (6) the sewed shirt is thoroughly wetted, preferably using a wetting-out agent in order to secure substantially complete shrinkage thereof; (7) the shirt is partially dried, preferably by means of a centrifuge so as not to stretch the goods; (8) the partially dried shirt is then pressed and folded in a manner so as not to stretch the goods, preferably by using a flat press or pressing-buck for the pressing operation.

(9) The said application for Letters Patent, Serial No. 121,552, was made in accordance with the then existing Acts of Congress and duly complied in all respects with all the requirements of the law in such cases made and provided and prayed for the issuance of Letters Patent for so much of the aforesaid invention as was embraced in the claims which were made a part of the application as provided by law.

(10) The said invention was most fully and specifically embraced in several claims of the application for Letters Patent, Serial No. 121,552, filed by Reliance Manufacturing Company in the United States Patent Office, including among others the following claims:

5 1. The method of manufacturing an article of
clothing made from a woven fabric which comprises, designing patterns of the various pieces composing the article of clothing, thoroughly wetting a sample of predetermined size of the woven fabric material of which the article is to be made to secure maximum shrinkage thereof, measuring the amount of shrinkage in both the direction of the warp and the direction of the weft, making patterns from those previously designed, in which the dimensions in

the direction of the warp are increased by an amount just sufficient to precompensate for shrinkage in the warp direction as determined from said sample of the fabric, and similarly increasing the dimensions of the pattern in the weft direction by an amount just sufficient to precompensate for the shrinkage in the weft direction as determined from the shrinkage of said sample, cutting the pieces of the article from the goods of which the sample was taken using the patterns of increased dimensions, sewing the pieces together to form the article of clothing, thoroughly wetting the article, partially drying the article, pressing the article upon a buck and folding it without stretching it, whereby said article will be of the desired size and shape determined by the patterns originally designed.

2. The method of making a sewed article of clothing from a woven fabric material which is capable of shrinking which comprises, completely wetting a sample of each lot of the fabric material, drying said sample without stretching it, measuring the shrinkage of said sample in the direction of the warp threads and perpendicular to said threads, preparing pieces for the article of clothing of dimensions increased from the desired dimensions in the direction of and perpendicular to the warp threads by percentages sufficient to compensate for the shrinkage of the material in its respective dimensions as determined by the shrinkage of said sample, sewing together the pieces to form the article of clothing, thoroughly wetting said article, partially drying said article, and pressing and substantially completely drying said article while the fabric thereof is unstretched.

3. The method of making articles of clothing from woven textile fabrics which comprises, shrinking a sample of the fabric to be used, measuring the shrinkage of the sample in the directions of the warp and woof respectively, cutting the pieces of the article of clothing using patterns the dimensions of which have been increased in one direction by an amount necessary to precompensate for the predetermined shrinkage in the direction of the warp yarn as determined from said sample, and increased in a direction per-

pendicular to the first named direction by an amount necessary to precompensate for shrinkage in the filler yarn, sewing together the pieces to form the article of clothing, thoroughly wetting the article of clothing to shrink it, and pressing the article while it is free from stretching forces.

4. The method of manufacturing an article of
6 clothing made from a woven fabric in which the
thread fibers are constrained in elongated condition
by starch or the like, which will be softened and partially removed during wetting and upon removal will permit the thread fibers to contract to their normal condition, thereby causing shrinkage in the article of clothing; which comprises cutting the pieces from the starched fabric, sewing the pieces together to form the article of clothing, thoroughly wetting the sewed article by means of water containing a wetting out agent, and pressing and folding the article substantially without stretching the thread fibers.

6. The method of manufacturing an article of clothing made from a sized fabric material, which after complete wetting will shrink to a predetermined size, which comprises, thoroughly wetting a measured sample of the sized fabric from which the article is to be made, partially drying said sample, pressing said sample to complete the drying thereof without subjecting it to mechanical stretching, again measuring the sample to determine the amount which it has shrunk in both the direction of the warp and in the direction of the filler, making working patterns for the various pieces of the article the warp and filler dimensions of which are greater respectively than those desired in the pieces of the finished article by an amount exactly sufficient to precompensate for the warp and filler shrinkage as predetermined from the shrinkage of said sample, cutting pieces from the sized fabric using said working patterns, and sewing said pieces together to form the article of clothing.

7. The method of making an article of clothing of sized cloth which when thoroughly wetted will shrink substantially, which comprises cutting a sample from the cloth of which the article is to be made, measuring said sample to

determine its length a in the direction of the warp and its width b in the direction of the filler yarn, thoroughly wetting said sample to obtain substantially complete shrinkage thereof, drying said sample without subjecting it to stretching, again measuring said sample to determine its reduced length c in the direction of the warp and its reduced width d in the direction of the filler, preparing a standard pattern for each piece to be used in the article of clothing, said standard patterns being of exactly the size and shape necessary in the finished article, preparing working patterns for each of the pieces, the working patterns having each dimension in the direction of the warp increased relative to the corresponding dimension of the corresponding standard pattern by the factor a/c and having each dimension in the direction of the filler increased relative to the corresponding dimension of the corresponding standard pattern by the factor b/d, cutting the pieces from the sized cloth from which said sample was cut, using said working patterns as guides, the patterns being properly positioned with reference to the direction of the warp of the cloth, and sewing together the pieces to form the article of clothing.

7 (11) The said application for patent and claims thereon was duly prosecuted as required by law, complying in all respects with the provisions of the law.

(12) The Primary Examiner refused to allow any of the above recited claims and finally rejected them on February 26, 1938, and a patent for the invention defined by said claims was, as the plaintiff submits, erroneously and contrary to law refused.

(13) Thereupon, and within the time provided by law, an appeal was taken by the said Reliance Manufacturing Company on April 4, 1938, to the Board of Appeals and the said Board, after having heard the same, on September 21, 1938, sustained the decision of the Primary Examiner and, as the plaintiff submits, erroneously and contrary to law rejected the said claims and a patent for the invention defined by the said claims was refused.

(14) On or about October 21, 1938, and within the time in such cases provided by law, a petition for rehearing was filed with the Board of Appeals, which said petition was denied on October 26, 1938, such denial, as the plaintiff submits, being erroneous and contrary to law, and a patent for the invention defined by said claims being thereby, as the plaintiff submits, erroneously and contrary to law refused.

(15) From the decision of the Board of Appeals rejecting the above recited claims and refusing a patent on the said application Serial No. 121,552, no appeal has been taken to the United States Court of Customs and Patent Appeals by the said Reliance Manufacturing Company, the plaintiff, or any other party, and no such appeal is now pending, nor has that court made any decision on an appeal
8 from the rejection of said application and claims,
but the plaintiff has, in the exercise of the rights given him by law, elected to proceed by this complaint as provided in Section 4915 of the Revised Statutes of the United States.

(16) The Commissioner of Patents has refused and still refuses to grant Letters Patent upon the aforesaid application for patent for the invention embraced in the above recited claims, although the plaintiff is lawfully entitled thereto.

WHEREFORE, THE PLAINTIFF PRAYS:

(a) That this Honorable Court adjudge and decree that Herbert G. Mayer and Robert Seyfarth are the first, original and joint inventors of the said new and useful improvements in Method of Making Clothing set forth in the above recited claims rejected in the said patent application Serial No. 121,552.

(b) That this Honorable Court adjudge and decree that Robert Seyfarth is entitled to receive Letters Patent of the United States for the said invention as specified in the above recited claims of the said application Serial No. 121,552 upon the payment by the plaintiff of the final fee which he is ready and willing to pay.

9 (c) That the plaintiff be granted such other and further relief as may be necessary herein and which this court may deem just and equitable.

ROBERT SEYFARTH

LYNN A. WILLIAMS,
BENJAMIN F. WUPPER,
2300 Board of Trade Bldg.,
Chicago, Ill.

JAMES H. LITTLEHALES
641 Munsey Building
Washington, D. C.
Solicitors and counsel for plaintiff.

10 Endorsed: Filed Apr 14 1939 Charles E. Stewart, Clerk.

Answer to the Complaint.

To the Honorable the Justices of the District Court of the United States for the District of Columbia.

1. Defendant admits the allegations of the citizenship and residence of the plaintiff.

2. He admits the allegations of his official position and official residence.

3. He admits the allegation of jurisdiction under Section 4915 R. S. (U. S. C., title 35, sec. 63.)

4. He admits that Robert Seyfarth and Herbert G. Mayer, claiming to be the original and first inventors of improvements in the Method of Making Clothing, filed an application for patent thereon on January 21, 1937, and admits that in said application averments were made corresponding to the allegations of paragraph 4, but denies that these allegations are sufficient to justify the issuance of a patent on said application containing claims 1, 2, 3, 4, 6 and 7, as set out in paragraph 10 of the complaint. 11

5. He admits that the said application, which had been given Serial No. 121,552, was assigned by the applicants to the Reliance Manufacturing Company.

6. He admits that the Reliance Manufacturing Company has assigned all interest in the application to the plaintiff Robert Seyfarth.

7. He admits the allegations of paragraph 7 as to the filing of said application.

8. He admits that the invention as described in the application pertains to a method of manufacturing cotton work shirts.

9. He admits for the purpose of this action that the application for patent was duly filed.

10. He admits that claims 1, 2, 3, 4, 6 and 7 were presented in said application.

11. He admits that the application was duly prosecuted.

12. He admits that the primary examiner finally rejected the said claims but denies that his action was erroneous or contrary to law.

13. He admits that on appeal to the Board of Appeals the action of the primary examiner was sustained, but denies that the action of the Board of Appeals was erroneous or contrary to law.

12 14. He admits that a petition for rehearing was denied by the Board of Appeals but denies that that denial was erroneous or contrary to law.

15. He admits that no appeal was taken to the United States Court of Customs and Patent Appeals.

16. He admits that he has refused and still refuses to issue a patent on said application containing the said claims but denies that plaintiff is entitled to a patent containing the said claims since these claims are deemed to be unpatentable over the following prior art and for the reasons given in the statement of the examiner in answer to the appeal and the decision of the Board of Appeals, copies of which will be furnished at the trial:

Ainslie,	1,480,541,	January 15, 1924,

Publication entitled "Textiles and Clothing", by Watson, page 212.

Profert of a copy of this patent and a copy of page 212 from this publication is hereby made.

R. F. WHITEHEAD,
Solicitor for the Patent Office,
Attorney for Defendant.

April 13, 1939.

I hereby certify that a copy of this Answer was mailed to the attorney for plaintiff on April 13, 1939.

R. F. WHITEHEAD,
Solicitor.

* * * * * * * * * *

II.

EXCERPTS FROM TESTIMONY AND PROCEEDINGS DESIGNATED BY APPELLANT.

14 *Opening Statement on Behalf of Plaintiff*

* * * * * * * * * *

This is a suit *de novo* * * * under section 4915, in which the plaintiffs are asking for an order on the Commissioner of Patents to issue a patent upon the application of two joint inventors, Mr. Herbert Mayer and Mr. Seyfarth, who filed an application, which was rejected by the examiner; made the subject matter of an appeal to the Board of Examiners in Chief; the application was rejected; and then this suit was instituted here.

I think that that gives the Court jurisdiction; that is, the history of the matter gives this Court jurisdiction. The application was rejected in the Patent Office, not on 15 the ground that any prior patent or any prior publication disclosed the process or method which was made the subject matter of this application, the claims of this application. Rejection was upon the ground that in view of the state of the art as represented by certain prior patents and publications, the disclosure of the Mayer and Seyfarth application did not involve invention; which of course is a prerequisite to the granting of a patent; and I believe that the question before Your Honor there is the elusive and difficult-of-solution question, whether or not a new thing never before done did involve invention as distinguished from the mere skill of one familiar with the art to which the invention applies.

* * * If I were to tell Your Honor in advance now what this invention is and all about it, then Your Honor's mind would be in a condition where you could not, no matter how hard you might try, put yourself in quite the position in which the art as these inventors found it was at the time they made what they think constituted an invention; and it would be after learning all about what they have done, what they have proposed to do, and how they do it, that Your Honor would be called upon to look through the prior patents and publications of the art and to de-
16 termine whether or not they disclosed something as the result of which it could be said that no invention was involved.

* * * Mr. Mayer, * * * one of the joint applicants for the patent, * * * is connected with the Reliance Manufacturing Co., of Chicago. The Reliance Company has long been engaged in the manufacture of garments * * * and more particularly cotton shirts, and even more particularly work shirts, workingmen's shirts made of cotton. I am expecting to call him as a witness to tell Your Honor something about what the problem was in that art which as he believes and as I think we can show Your Honor was very satisfactorily solved by the employment of this invention; and therefore, unless the Court or counsel specially wish me to do so, I won't go into the details of the application in any extended sort of way. I think it would prove to be somewhat repetitious in view of the testimony that we expect to offer.

But I should like to say rather briefly that the problem toward which this invention (as we hope) was directed was

this—that you buy a shirt and wear it, have it laundered at
home or at a laundry, and it becomes smaller, due to shrink-
age resulting from the laundering processes, and gets
smaller and smaller, until it attains a final size which there-
after it will retain. That of course is a matter of rather
common experience. The object of Mr. Mayer and Mr.
Seyfarth was to devise a method of making what we
17 will call shirts, although the process is applicable to
other garments, but it is simpler to speak of them as
"shirts" for the moment—a process which would avoid
that shrinkage which used to occur in shirts after they were
completely manufactured and sold to the buyers. I will, if
Your Honor wishes, explain what that process is.

The Court: Yes, I should like to know just what the case is about.

Mr. Williams: Either Mr. Mayer or I can explain it to Your Honor. This process contemplates in its practical contemplation its use almost uniformly and invariably in the case of colored work shirts, shirts that are colored by some dyeing process, applied either to the cotton before it is spun into yarn or a dyeing of the yarn itself before it is woven, or a dyeing of the cloth after it has been woven. The process entails the making of a garment out of the material that comes from the weavers and the finishers, and at a time at which the cloth or fabric has been sized and calendered, usually; if it is a print goods, after it has been printed—in other words, a more or less completely finished fabric or cloth.

I am going to make this a little shorter than perhaps we
shall want to make it, unless Your Honor would like me to
go into it in a good deal of detail. In the processes of
making that finished material which is delivered to the man-
ufacturer of the shirts the cotton fibers are subjected to a
succession of stretching operations, and the cotton
18 fibers in their natural state are spiral corkscrews or
crinkled fibers of a length of perhaps an inch or two
inches, something of that sort, depending upon the charac-
ter of the cotton; but if you have material which is made

of these more or less crinkled or corkscrew fibers of cotton it goes through a succession of processes in the course merely of making the cloth, the effect of which is to straighten out the several fibers. One of the processes, one of the first steps, in converting cotton into cloth is the carding process by means of which the fibers of cotton are combed, straightened, and laid all in the same direction generally.

Then there is the step of roping, whereby the cotton is brought into the form of a rope perhaps as big as your finger or your thumb, in which the fibers are laid more or less in the same direction, and then that rope is made slimer by a stretching or pulling operation or by a long succession of these. Next follows the spinning of the yarn or yarns, that are combined into a yarn made up of several strands, and in that spinning operation there is again a constant pull upon the fibers of the cotton, a tensioning step.

When it comes to the matter of weaving that yarn into cloth, there are warp threads, which are put under a tension in the loom, and then one thread is raised and the adjoining thread is depressed, alternately, all the warp and weft threads, then all the warp threads, then a weft thread or
“woof” thread as it is called, by means of a bobbin.
19 It is shot through between the warp threads. Then
the warp threads are reversed in locations—I do not know whether I can hold my fingers as I would like to, now, but the bobbin is then thrown through, carrying thread again between the warp threads, and there is an up-and-down movement of those warp threads with this weft thread being shot and drawn through between the warp threads, first in one direction and then the reverse direction, in such a way as to leave it (for simplicity's sake) in the form of a succession of interwoven yarns.

In that weaving process the warp threads are maintained necessarily under considerable tension, and the weft threads are thrown and pulled through between the warp threads under considerable tension. So the result is that the fibers of the cotton which have this naturally crinkled or spiraled

form have those crinkles or spirals more or less drawn out of them in this succession of operations involved merely in making the cloth. Now, in order to permit the cloth to be handled in a factory, where it is spread and cut and sewn and one thing and another, the practice is, and there are reasons why it is necessary or thought to be necessary, at any rate desirable, in order to facilitate the manufacturing operations, to size it, which means to impregnate it with something corresponding with starch, something which usually I think includes starch; it may include something that is called "gums" or "tallows"—in other words a mixture
of materials which when dry has something like the
20 property with which we are all familiar in connection
with starch and starching, that it more or less fills the pores and the interstices between the several fibers of the material, the interstices between the several yarns of which the cloth is woven, and holds them more or less flat, somewhat stiff, I mean very stiff; but, as compared with an unsized material which has the property of being rather sleazy and subject to bending and twisting and pulling, the effect of this sizing or starching is to hold the cloth smooth, and by impregnating the interstices between these several fibers of the cotton itself to hold each fiber straightened out, as contrasted with a condition of the several fibers in which they would have several "crinks" or something that you can think of perhaps as corkscrews, little spirals.

The result of that is that when the cloth is delivered to shirtmaker it is held by the sizing in a condition such that all of the several fibers of the cotton of which the material is made have been straightened out and are held in a straightened-out position. If now the shirt is made of that material, sized, the operations involved in the manufacturing, the spreading of the cloth on tables, which will be extended, the cutting of it, the sewing of it in a variety of machines and with a variety of folding operations, which witnesses will illustrate to Your Honor somewhat briefly—
that shirt is made up by being cut, the pieces sewn
21 together, and then pressed in the usual way; and the

present operations involve some further stretching of the material in order to smooth it. It is then folded up, boxed, and sold. The result is that it will have a given sized sleeve length, collar band—all of the dimensions.

Experience has taught all of us, doubtless, that when that shirt is sent to the laundry or washed at home it grows smaller. The theory underlying the process which Mr. Mayer and Mr. Seyfarth think is original with them and a proper subject matter for patent is—and we do not know that anyone has heretofore had this theory; we think the theory is correct—the theory underlying their process is this—that when the cloth of the shirt or of the garment is completely wetted—it may not occur in the first laundering, it may take several launderings or several washings to accomplish it, but those washing and laundering operations have the effect of dissolving or at any rate softening that sizing material which we can think of as starch, although it does contain tallows and gums as they say—the effect of softening that sizing material is to release these several fibers, millions, doubtless, of fibers of the cotton itself, in such a way that these little spirals or crinkles which grow into it, in the cotton itself, will assert themselves and cause the fibers to pull themselves together, contract themselves, back into the shape in which they have those little crinkles or little spirals; and that means that if you have a fiber
which we might say is two inches long—and I imagine
22 they measure as long as that in cotton—assuming
they are two inches long, that fiber, if it is released from tension, the tension to which it has been subjected in this long series of operations that I described and given its freedom by releasing it from the strait-jacket which is provided by the starch, if that starch is softened or dissolved away sufficiently to release each individual fiber from the strait-jacket of starch in which it has been "set", as I think they call it, then the fibers will assert that tendency to pull back into the somewhat spiral or crinkled formation in which they grow; and the sum total result of that contraction of all of the fibers is to contract all of the pieces of

cloth of which the garment is made, and we then have what is commonly called and what is of course "shrinkage", true shrinkage of that material.

Now, that is the thing that is objectionable. There have been some efforts to provide garments—had previously been efforts to provide garments which would avoid either that shrinkage or something that was comparable to it. I think the best known and most widely used method was that described in the Cluett patent which was cited, I think, not in the Patent Office, but we received notice that it would be brought to Your Honor's attention. We have no objection of course to supplementing the Patent Office record by the presentation of that patent. That shows or describes what is known in the trade as the Sanforizing process, and
23 very possibly Your Honor may have seen that advertised.

The Court: I have seen it advertised a good deal, and I wondered if your process had any connection with the Sanforizing process.

Mr. Williams: Well, the Sanforizing process is widely used and it is very popular, and I think—we think it is highly desirable and highly advantageous. I do not know whether Your Honor has had personal experience with Sanforized shirts, or not.

The Court: Not that I know of.

Mr. Williams: Maybe you have had, without knowing it.

The Court: I have had experience with common shrinkings.

Mr. Williams: If you get a Sanforized shirt you will find that it will overcome the shrinkage to a very considerable degree; not so well, we think, as our process does it. We want to go into that Sanforizing process in a little more detail, but that patent discloses a very interesting and I think ingenious method of accomplishing the desired result, which it almost completely accomplishes perhaps, or at least if it is manipulated in just the right way it can go a long way toward accomplishing the result; but in accordance with that Sanforizing process, the cloth, made in gen-

eral in the way in which I have described, by a succession of operations, all of which involve tension to cloth, comes finally to the machinery by which the Sanforizing of that cloth is accomplished; and here again, without going
24 into that in any great detail for the moment, that involves, I think, not any recognition whatsoever of the fact that the fibers of the cotton have naturally these little crinkles in them or are made up of little corkscrews of cotton fiber; there is nothing in or about that patent that recognizes anything like that in any way, unless possibly it is some references in the patent to what is called "spontaneous shrinkage". If by "spontaneous shrinkage" is meant the result of the effort in the action of these several fibers in drawing themselves together when they are freed in such a way that they may do so, why, well and good; I do not think it matters in so far as the patentability of our process is concerned.

The Court: You do not contend that your theory of shrinkage is patentable?

Mr. Williams: No; and I have said to Mr. Mayer, who is here, and to my associates, and I will say to Your Honor, that if these gentlemen had devised this method of handling, they may never have known even that the goods was made of cotton fibers or that they had crinkles or corkscrews, and still the thing would either be patentable or not patentable, quite independently of their theory as to the why. Nevertheless, I spoke of the fact that Cluett appears not to have had a recognition of the theory, or that he did not have the theory; and I say that only for the reason that I want to point out to Your Honor the rather different
25 method and process which he evolved from the one that we are seeking to patent. He might have done something; he might have proposed a different method, if he had had a theory as a guide or a suggestion; but at any rate, what Mr. Cluett—and his name was Sanford Cluett; I presume likely the "Sanforizing process" got its name from his first name—that patent feeds the cloth to some

machinery in which the effort is, as I had thought until I studied into this matter a little more in detail, the effort was there to shrink the cloth of which the thread or other garment was to be made; first to shrink the cloth and then make your garment, with the result that the garment would not thereafter be subject to shrinkage. It does not quite work out that way, as his patent says; and we will want to call that to Your Honor's attention; but I think that what Sanford Cluett did was not so much to shrink the cloth in the true sense of permitting the fibers to contract themselves; I do not think he did so much that, as he put into the cloth a substitute for shrinkage. There again I do not think it is very important whether my understanding of that is right or wrong; nevertheless I do think it is important to know what is done in that Sanforizing process, how it is accomplished; and there again without going into it in too much detail, the cloth is fed to what is shown in the patent and what was called a "tentering machine", and a tentering machine, as I understand it, is a machine which operates in such a way as to take the cloth and
26 straighten it out sidewise. If this is the length of the material, it pulls it out and straightens the edges and gives it a uniform width. I believe that that tentering step might or might not be involved in the Sanforizing process of that patent. The tentering is shown as the first step. It is shown diagramatically, very diagrammatically, and the detail of it is no part of the Cluett statement of the claims of his invention.

Following that, the cloth goes through a steam box, or at any rate a box in which the cloth is wet with steam or with water and steam, and the effect of that water and steam is in the manner that I have described to soften at least the sizing material, the starchlike material. It goes through that steam box while the "web" as it is called of cloth, which means simply the length of the cloth, is put under a greater tension lengthwise by running it through a pair of feed rollers at the inlet end and taking it out by some other

rollers at the other end; and if you should run the rollers at the outgoing end faster than the rollers at the ingoing end, then obviously the cloth is clamped tightly and there would be a stretching of the cloth as it goes from the inlet rollers to the outlet rollers. There are adjustments which you can make to regulate the relative speeds at which the inlet rollers and the outlet rollers run, so that you can put the cloth through there with little tension or no tension, and if there is shrinkage that occurs in the steam box,
27 why, then it is possible that you would want to run
the outgoing rollers a little slower than the incoming, and let the contraction of the cloth be accomodated, but at any rate the cloth goes through that steam box under some tension in a lengthwise direction. Now, the effect of that is (I wish that I had about twenty fingers, and that they were very rope-like in consistency; I could then weave for Your Honor a piece of cloth, here)—but Your Honor will picture what I would like to put together here, and then you will appreciate that if all of those ropes or in this instance little yarns that run in the lengthwise direction are pulled quite taut, they will tend to put "crinkles" as Cluett calls it into the crosswise yarns; that is, it will give them a more pronounced up-and-down weaving through the warp threads than as if the warp threads were quite slack and you pulled sidewise. In other words there is a clear recognition in his patent that if you pulled the cloth in the warpwise direction, you would accentuate the up-and-down "crinkling" as he calls it (rightly) of the weft threads; and when the weft threads are crinkled, when they are given a right sharp up-and-down turn, that pulls the cloth in and narrows it.

The Court: I remember that quite a while ago they made clothes out of what they called "crash" material, and every time your trousers got rained on they would get longer and then smaller, until finally you couldn't get them on at all.

Mr. Williams: Let me tell Your Honor one of the
28 things that we want to come to and that has to do

with this Sanforizing process. I will tell you about that in a moment rather than just now. Cluett says, "Pull the cloth lengthwise and in that way contract it sidewise by adding to the crinkledness of the weft threads." He then says that "Now, having stretched the cloth out lengthwise and contracted it sidewise so that it is narrower than it was, you then do with it a very interesting thing." He says, "I will now run it on to an endless belt of felt about a quarter of an inch thick. This belt of felt comes over a roller, makes a turn, then it goes under a good-sized drum which is heated for drying material, and then the belt, after going around that drum, then around some other rollers, and so on, comes back to the beginning place, where it comes up over a roller and starts in again." Cluett says, "After this cloth comes from this steam box where it has been moistened and where this sizing has been softened up and where because of the endwise tension it has been narrowed, I will now fasten it" as he speaks of it I think, or substantially that—at any rate, he applies it to this band of felt between a roller, and he speaks of the speed at which the cloth comes in as the "nip", between the roller and this felt; he has some electrically-heated ironers at a point at about where it goes in. This belt as I have said runs around a roller which is heated, which is going to effect the drying
out of the moisture and therefore the re-setting of
29 this starch or sizing material; but the result of that
operation is like this, if I can illustrate it: The moistened cloth will go on to that belt while it is convex, as I show it to Your Honor. Then as it starts down under this other roller, it begins to bend in the reverse direction, and Your Honor will see that I have put some crinkles into this handkerchief with which I am illustrating. If I had a clean handkerchief I am sure there would be more crinkles; nevertheless this will serve to show that the bend of that felt belt first from its convex position into its concave position will cause the belt to elongate or shorten relative to the middle or median plane of the felt and in such a way that

this surface on to which the cloth is led will be first of a given length and then of a decreased length; and as that length of belt is decreased this belt running as it does right around the surface of a roller will have the effect of pushing this cloth together lengthwise and pushing into it what he speaks of as "crinkles" in the warp yarns.

Now, those crinkles are not put into the warp yarn by stretching sidewise. That could be done. I presume if I were to take this handkerchief and could hold it uniformly here at the ends and were then to pull it, I possibly could demonstrate a contraction sidewise, I don't know; but it does occur under the circumstances of this Sanforizing process. This is true also, that if I were to stretch that cloth sidewise, I could put good sharp up-and-down crinkles into the warp threads.

The Court: I take it the effect would be practically the same as when you undertake to take a wire for instance that is used for chicken wire; if you stretch it this way, it will be too narrow.

Mr. Williams: I think it is the same sort of thing. The trouble is that a person doing just that—or, the trouble would be that if you pull and contract the cloth sidewise—that is what you want. Now, if, to put the contraction in lengthwise, you were to pull it sidewise, then you would be left with cloth which subsequently would shrink sidewise. And his object is of course to get into the cloth what I am not going to call "shrinkage" for a moment but a "contraction", both sidewise and lengthwise. He is willing to get it in sidewise by pulling lengthwise, but after he has pulled it lengthwise to get the contraction in crosswise then he doesn't want to pull it in sidewise, but he does put the cloth now over this belt and through the ironing roll, which will "compress" it as he calls it, and I think that is a good name for it. He more or less endwise compresses that cloth within that confined space, and at the same time dries it with this heated drum and re-sets the starch, with the result that these warp threads which he had formerly tensioned

a little bit to get the sidewise shrinkage, are now subjected to a kind of pushed-in crinkling by endwise compression
between this belt and the roller, and the result is you
31 have left material in which the weft threads have
been crinkled by pulling the warp threads, and subsequently under which the warp threads have been crinkled by pushing them endwise, and the result of that is that you have cloth in which, for all I know—and I think it would be true—in which these fibers of the cotton are still straightened, but in which the yarns made up of hundreds of thousands of fibers have these up-and-down crinkles put into them.

That Sanforized piece goods is then sent to a shirt factory we will say or a pants factory, and I do not know what your Honor's friend's experience may have been with, but these gentlemen can tell you about the experience of one of their rather well dressed friends in the clothing trade for whom they made pants out of this Sanforized material. The Sanforized material according to the patent and according to the practice, at least if it is carried out ideally, is by laundering the piece goods before it is subjected to the Sanforizing process, to find out how much it will shrink or contract both in the crosswise direction and in the lengthwise direction, how much per yard. Cluett says, that having been determined, he can give the material as it goes through enough of an endwise stretch to pull it in in an amount just corresponding with what he has predetermined to be the right amount, and then he can by this endwise pushing operation, by giving the belt the right amount of radius of turn and the right amount of shortening
as it goes through these rollers, he can push into the
32 lengthwise yarns an amount of crinkling or an
amount of contraction corresponding with the amount of shrinkage which by pre-testing he has determined will occur in the cloth.

I do not know whether Your Honor's friend's pants had been Sanforized or not, but our friend's pants were made out of this Sanforized material, and I think that, supposing his pants should be 32 inches long, the end seam. We took, or some of these people took a Sanforized piece goods, cut them as they say, that such a pants would have an inseam length of thirty inches long, and then made the pants and delivered them to this well dressed gentleman, who said that they were too long. Now, we know and think they were. I do not know that they were measured at the time when they were finished, but at any rate he said they were too long, and we now know that they doubtless were too long; and that is for the reason, that if you take this Sanforized material to which you have done something that I can't quite do but I can do something like it; I could push into that material a lot of crinkles, and that is what the Sanforizing does, in a way, pushes crinkles into the yarn; it could be somewhat like the crepe paper that is used sometimes for making napkins and a variety of articles, and if you pull it a little you will find that there is a good deal of very easy yield to it.

Well, now, under the Sanforizing process, after that has pushed into this cloth the crinkles of the warp
33 threads, and you take your cloth into the factory or
sewing room, Mr. Mayer or Mr. Bard will show Your Honor some of the folders, funnel-like devices by which the cloth is run into and through the sewing machine, and it is necessary to put a little tension, quite a marked tension on that cloth in order to run it through the sewing machine, and in doing that with Sanforized cloth you pull those crinkles out of the cloth to a certain extent, so that in the instance that I speak of this well dressed gentleman's pants came to be about 33 inches long instead of 32. He did not like to wear them, so he had an inch cut off; then he wore them. Then he had them laundered once, and they came back, too long. That is due to a phenomenon that is referred to in this Cluett patent that Your Honor will see, namely, this—that the shrinkage—he doesn't call it "shrinkage" of these fibers—the contraction of the

corkscrews or the crinkles of the fiber; he calls it "spontaneous shrinkage"—which may be just as good a name for it, I recognize as our other name, for what occurs—but at any rate when that material is first laundered, if it were material in which the fibers were all straight into which these crinkles had not been pushed, then doubtless in that first laundry it would contract or it would shrink, but if you have pushed into this cloth by the Sanforizing process enough of the sharp up-and-down crinkling of the yarn to correspond with the ultimate shrinkage which you would finally get after a succession of operations,
34 then the first time the material is laundered two
things as we think will occur. One is the contraction of the individual fibers to some extent, not as much as they are subsequently going to contract, but that is off-set—and I think the word "off-set" is used with respect to spontaneous shrinkage in this Cluett patent—that is off-set to some extent by the fact that the crinkles which have been pushed into the warp yarns will straighten out so that the crinkles permit the cloth to elongate while the contraction of the fibers tends to make it shorten; and in one instance at least, and I should think it would be likely to, in most instances—in one instance, at least, the straightening out of the crinkles of the yarn more than off-set what contraction occurred in the fibers in the first washing, and the result was that this well dressed gentleman's pants, after the first washing, were longer than they were after he had cut it off an inch. So he had some more cut off. Then he had them wased or dry-cleaned again. By that time probably all the crinkled effect had been flattened out and the contraction of the individual fibers began to get in its succession of contractions so that as each time he had these pants washed or dry-cleaned, why, they began to get shorter and shorter, until in a short time he did not want to wear them any more.

Well, now, I speak of that, not to condemn or to find fault with this Sanforizing process, which has this very

35 considerable advantage. You can measure by a succession of laundering operations; you can take some cloth, measure its length and its width, launder it four, six, or a dozen times, until there is no more contraction or shrinkage; measure what that is; then you can push into the cloth sidewise crinkling enough to correspond with that ultimate shrinkage sidewise, enough crinkles lengthwise to correspond with what ordinarily will be a different amount, quite a markedly different amount of contraction or shrinkage lengthwise, make your garment, and then while it may not come—it may be too large after the washings or too large in one direction, not in the other, but after a succession of laundering operations, why, theoretically it can and will come to the ultimate size which is desired, and I have no doubt that when the process is accurately carried out, carried out in a way in which it can be carried out, that that will be the ultimate result; but the process, there, to make a brief statement of it, or its essence, seems to me to take the sized piece goods, to put into that goods crinkles, mechanically to put them in, force them in, first by stretching one way then by compression, compressing as he says in another direction, and get into that material an amount of crinkling which will correspond with the amount of shrinkage; and that I think of as genuine, true, or real shrinkage; the amount of shrinkage which will ultimately occur because of the contraction of the several fibers. That process is widely used and has the
36 advantage that I ascribed to it without the least
hesitation, and it has some difficulties, one of which for example is this. I may have spoken of it or alluded to it. It has the difficulty that it makes the material harder to handle in the manufacturing process. The crinkledness of it gives a sleaziness as I think it may be spoken of in the trade, a disposition to yield easily in this direction and that; and in such a way that it makes it harder to cut it accurately to the size of the requisite pieces, slows down the cutting operation quite materially, and makes it more

expensive to cut; and then all of the sewing machines—and we want to call Your Honor's attention to some of those sewing operations, as for example operations which put a hem into the material in the various places corresponding with that on this handkerchief. Well, I would not have known—perhaps Your Honor has had an opportunity to learn, but unless you have, you will be interested to see with what ingenious machinery that hem is turned before the sewing occurs. That is indicated here.

The Court: I have seen the hemmers on the ordinary sewing machine.

Mr. Williams: Yes.

The Court: They have hemmers.

Mr. Williams: Your Honor then knows that there is a little, what I think of as a special funnel. That feeds into a funnel which has the little job of turning the cloth
37 so that when that comes out at the end it will have
in it the kind of fold that is desired; in order to feed that cloth into the folder or funnel you have to pull it a little, hold it under some tension, quite a marked tension. These things run like lightning in a shirt factory. The girl has to pull that little handle, and if the cloth is all crinkles like crepe paper she is likely to stretch some of those crinkles out or be careful that she doesn't, and it is harder to turn this material after it has gone through a Sanforizing operation. The sizing that is given to cloth normally and the calendering and the finishing in general are all intended to facilitate the sewing operations that go on in the garment factory and in a shirt factory, and if that sizing has in a measure been dissipated by this Sanforizing operation and particularly if the goods has been given this crepe paper crinkle, why, all people that know all about it say that they find added difficulty in handling that material; and furthermore, that they will put some stretch into it as they pull the crinkles out, and therefore you will ultimately come out with what you want, but in the process of getting there, there are some difficulties, and

then you have to wait until the thing is done, until you have gone through two or three or four or six laundering operations, until the thing comes finally to the unshrinkable garment, which was the objection.

Now, that all may sound as though I was disparag-
38 ing this Cluett process. It doesn't matter whether it is good or bad, it is widely used. We say it is good. That is unimportant, of course. The important question is whether we have something.

It is not necessary that ours be better. We think it is, but the question is not whether ours is better. The question is whether ours is different, and whether it is different in a patentable sense. Of course, Your Honor knows that, but I want you to know that I know that, too. I am not here to prove that the one process is better or worse than the other, which of course is unimportant.

Now, what is our process as contrasted to that? Well, it is this. We will take the piece goods, that which for brevity we can call "regular piece goods", which means piece goods which have been manufactured in the normal way in which piece goods have been manufactured I presume for hundreds of years by the spinning and weaving operations, but which is delivered after it has been finished by impregnating with starch, gums, and tallows; it is sized, in other words; it may have had the fuzz burned off by a singing operation, and it may have been calendered by running it between hot rolls that do not run at the same speed, and give it something of sheen, so that it slides easily through the machinery. That is a whole art in itself, and I do not know much of anything about it, haven't had occasion to, as I think, here, to try to learn; but it comes to the shirt manufacturer with all of the finish which decades of
39 experience have taught is the most desirable finish with which to put the material through the cutting and sewing operations.

The parties here, Mr. Mayer and Mr. Seyfarth, put that material through the operations of cutting and sewing without changing that size by any wetting operation or by any compressing operation, or otherwise. What they do do is to take a piece of the material of which they are going to make the shirts, and perhaps we could get one of those pieces of covert and a piece of chambray, here. Maybe I am telling Your Honor too much about this; I will expect to cover this by our testimony, and if I am going into it in too much detail, why, stop me, of course. But if we had a table here on which we could lay out these two pieces of cloth, Your Honor would see—perhaps I can hold them up in such a way that Your Honor will see. I am holding, I think, the end of this material. Yes, these white stripes represent the selvage of the samples. I cannot now see it myself, but Your Honor will see a shrinkage of somewhere in the neighborhood of two inches sidewise, and somewhere I presume in the nature of or of the order of four inches, three or four inches, lengthwise, in that one yard, as I have seen them laid out on the table, here—yes, the difference from here to there, about four inches, when it is flat. That is the shrinkage which one square yard of this covert cloth will take sidewise and lengthwise respectively, as a result of normal laundering operations. And that is, well, a very appreciable contraction. I think of it as a sleeve length. Well, it is three or four inches change.

This process of Mr. Mayer's and Mr. Seyfarth's involves making the patterns for a shirt and giving to the patterns for the sleeve and the front and the back and the collar and the pockets and all the several parts the size which those pieces should have in a shirt which is either a 15 size, 15-33, or 16-34, or whatever it may be, and then, having predetermined the amount of the shrinkage in the weft direction and the amount of the shrinkage in the warp direction to which that goods will become subjected, to take those patterns and revise them so that, if this piece of paper may represent crudely the pattern for a sleeve or the piece of cloth, if that should represent a sleeve; if that sleeve is to come out of that material in the length—or warp-wise direction, then make it longer.

The Court: In other words, just allow for the shrinkage, and make it that much larger; is that the idea?

Mr. Williams: Partly, yes; in both directions, and different amounts in the two directions, corresponding with the different amounts of shrinkage here and with the amount of shrinkage; and the relative amounts lengthwise and crosswise will not be the same with different kinds of
material. Here, for instance, is some chambray, and
41 I think that the sidewise shrinkage there was about
an inch.

The Court: Hasn't that been done time and time again by housewives and everybody else?

Mr. Williams: In a rough-and-tumble sort of way, yes; that is, housewives—one of the references here is a book addressed to housewives, which says just what Your Honor has in mind. This book says:

"Shrinkage of material before making is desirable in wash goods which will be laundered soon."

I think that was the only sentence that was relied on, here; perhaps more. It goes on to say "wash materials". Well, I will read the sentence, the paragraph:

"Shrinking of material before making is desirable in wash goods which will be laundered soon. Wash materials which will be worn a good many times before washing should not be shrunk, as wetting removes or disturbs the finish and they will then muss or soil more easily. Allowance can usually be made in some way for shrinkage. A sample of the material may be measured and then washed, pressed, and measured again to determine the percentage of shrinkage."

The Court: Hasn't that been done for a long time—making things oversize to allow for shrinking?

Mr. Williams: Hasn't that been done?

The Court: Yes—constantly.

42 Mr. Williams: Yes. I can't say that I remember it, but I know it, because the books say so; so there is no doubt about that.

The Court: This is the lunch hour. I will take it up after lunch.

(Whereupon, at 12:30 o'clock, Court recessed until 1:30 o'clock.)

After Recess

The recess having expired, Court reconvened at 1:30 o'clock, and proceeded further with the hearing of said cause, as follows:

Mr. Williams (resuming the opening statement): Your Honor has reminded me of what I presume I knew as a boy —could have known—that when my mother made my pants she cut them a little large. The domestic science book says to do so, and we have that much of the prior art which confronts us.

I had been outlining in a brief way what our process of manufacture entails, the enlargement of the pattern in the direction of the warp and in the direction of the weft, correspondingly with the predetermined-by-measurement amount of shrinkage in the two directions. That entails making the patterns, laying them out in such a way that where seams are made, say that we have to pile up two or three or four or five or in some instances I think as many as eight layers of cloth, that they will come together in the direction of the warp or the direction of the
43 woof, so that shrinkage of the two, one more than the other, won't cause puckering in the other, and so on. We perform all of the operations of laying out and marking a good many layers of cloth at a time, 300 deep, half a foot thick of material, cutting it with a cutting machine in accordance with the marking that has been transferred from patterns which have been put into the form

of a chart many yards long on this cutting table; performing the sewing operations. Buttons, button holes, and so forth are applied. When that has been done, then our shirt, too large for the size in which it is to be sold, which it is to take, is subjected to a shrinking step, which involves wetting it or immersing it in water which contains a wetting out agent. A wetting out agent is a chemical, one named in the specification as naphthalene sulphonic acid derivative, the effect of which is to overcome what would otherwise be a difficulty, and that is a difficulty that our common experience would tell us something about, namely this, that new clothing containing this sizing of starch and gum and tallow, a combination of a mixture of the material with which the cloth is impregnated to keep it smooth and to keep it from getting soiled and to facilitate the sewing operations; that material is of a character such that it is somewhat water-repellant normally, and drops of water on new unsized fabric are a little like water on a duck's back, they are inclined to run off, they will soak into the
material in time and wet it thoroughly. It is a
44 matter of time, and when it is done by ordinary
laundering operations why it involves washing the shirt three or four or six or eight times before all of that sizing material has so far released the separate fibers of the cotton as will permit them completely to contract in the manner that I have described.

Now, in our wetting operation we employ enough of this wetting out agent to cause the water very quickly and very completely, within a matter of minutes, to soften and dislodge that sizing material and to penetrate into the fibers so that within this matter of two or three minutes the fibers are sufficiently completely released so that they all will contract as we think of it, which may be in some measure a matter of theory, but whether or not that is theory, the result is that the cloth does within that two or three minutes shrink in all of the directions in which it can or ever will shrink, to a degree, to an extent such that there is no more shrink to it, all of the shrink has occurred, and it comes completely to what will be its final size.

Now, one more thing is involved.

The Court: May I read one of your typical claims?

Mr. Williams: Well, one is at the beginning. We might as well look at that one as any:

> "The method of manufacturing an article of clothing made from a woven fabric which comprises, designing
> 45 patterns of the various pieces composing the article of clothing, thoroughly wetting a sample of predetermined size of the woven fabric material of which the article is to be made to secure maximum shrinkage thereof, measuring the amount of shrinkage in both the direction of the warp and the direction of the weft, making patterns from those previously designed, in which the dimensions in the direction of the warp are increased by an amount just sufficient to precompensate for shrinkage in the warp direction as determined from said sample of the fabric, and similarly increasing the dimensions of the pattern in the weft direction by an amount just sufficient to precompensate for the shrinkage in the weft direction as determined from the shrinkage of said sample, cutting the pieces of the article from the goods of which the sample was taken using the patterns of increased dimensions, sewing the pieces together to form the article of clothing, thoroughly wetting the arcticle, partially drying the article"—

I think that is "by means of a centrifugal extractor". I do not know whether that is in the copy Your Honor has, but that has been deleted by amendment.

> "—pressing the article upon a buck and folding it without stretching it, whereby said article will be of the desired size and shape determined by the patterns originally designed."

46 **The Court:** Is there a claim made for that particular chemical?

Mr. Williams: I think none has that particular chemical, and that particular chemical is not new with us nor is the wetting out agent new with us. It is a chemical that is used in the dyeing operation.

The Court: Now, what is new in your claims?

Mr. Williams: This sequence of steps—I wanted to add the final one to which that claim does refer—that is, the step of drying and pressing this garment flat as distinguished from pressing it on a curved buck in which some stretch occurred, with the result that no stretching of the garment is effected by that final pressing operation. That is, it is set in the size and shape which it is given in this thorough wetting step. There are claims which do say not merely thoroughly wetting the article, which is the kind of wetting which is accomplished by the use of a wetting out agent, but some of the claims, as for example No. 4, refer to the use of a wetting out agent, as for example in the last three lines, where it is said, "thoroughly wetting the sewn article by means of water containing a wetting out agent," of which this naphthalene sulphonic acid derivative in the specification is cited as an example; and there could be others.

Your Honor says, "What is there new about this?" I would like to add to what I have said relative to the
47 prior art which has been cited in the Patent Office
and by notice for use before Your Honor, namely, this Cluett patent and one other reference, namely, the Ainslie patent of the prior art wherein it is proposed to cheapen the process of manufacturing a garment, and it stresses particularly the manufacture of collars, and it points out that in making collars the practice had been to finish the piece goods by bleaching and by sizing it. I do not know whether it mentions all of the steps of calendering and one thing and another, but at any rate, take finished goods, take it and sew it into a collar. I think it is pointed out in that patent that the piece goods, as a more or less final step in the process of finishing, is washed or laundered or cleansed. Then it points out that in the processes of manufacturing

by cutting and sewing and so on it may become more or less soiled, so that a second washing or laundering step is the final step in the collar factory, and the collar is sold after that washing. The Ainslie idea was to avoid what he refers to, perhaps not in these words, as a duplication of effort in that successive washing, and his proposal is to make the collar, that is, do the cutting and the sewing in goods which has not been finished in what the trade calls "gray" (greig) goods, that is, goods that is unbleached and not finished by calendering and the singeing and one process and another. The collar is made of that "gray goods", and it is made too large again, as our mothers made our clothes, and in
48 the same somewhat general and indefinite amount of enlargement, after which, that is, after the sewing has been completed, then the collar is bleached, subjected to a bleaching operation in a liquid in which oxygen is liberated, after which the bleaching agent is washed out, and that effects a laundering operation, after which the collar is ironed and ready for sale. He says:

"The piece goods as it comes from the loom may be singed if desired, after which it is removed to the cutting room where the blanks are cut to larger size allowing for shrinkage. For a 15 collar, the blanks will be cut between 15½ and 15¾ size, preferably about 15¾, as it is preferable to have a finished collar slightly oversize than slightly undersize."

I think I have said those things about these prior art matters that have been cited and of which notice has been given, but that I might refer again to this Cluett patent which has to do with the Sanforizing process, wherein it is pointed out that the amount of shrinkage in both directions may be measured by test made of material which is laundered repeatedly until there is no more shrink to the goods, and by way of example it is said here (p. 6, lines 66 et seq.):

"A specific instance of preshrinking to accommodate ultimate laundry shrinkage may be my preferred treatment of

a 'uniform twill' of which the maximum laundry shrinkage may be determined by test at 2.25 inches per yard in
49 warpwise dimension and 0.55 inches per yard in weftwise dimension after four launderings."

I think that makes a pretty fairly complete statement of the essentials, at least, of these prior art disclosures, and all of them.

Well, now, that leaves us with this: There was the general admonition in the domestic science book, and a matter perhaps of common knowledge, that the mothers, dressmakers, and other people cut things too large, knowing that they would shrink. "How much?" was a matter of guesswork. In some instances it was suggested that the amount be determined by measurement without in any instance suggesting that that be determined by measurement both weftwise and warpwise. This Cluett patent suggests measurement of the amount of shrinkage both warpwise and weftwise, and then applies it to the process which I have described, which is briefly stated and perhaps inaccurately, but Your Honor will understand what I mean, having explained it in more detail—that is applied by putting crinkles into the weft threads and into the warp threads by an amount which will correspond in each of the dimensions with that predetermined shrinkage, so that in your sewing operations all of the manufacturing operations are carried on not with the kind of material which is best adapted for those operations, namely, a sized and a smoothed and a somewhat firm material, but with a material which has the "sleaziness"
50 as they call it, due to this crinkling, a lack of paper-like quality which makes it lie flat and stay flat.

We have in this Ainslie patent of the prior art the general recognition that shrinkage may occur; nothing about there being shrinkage in the two directions but in one only; to make your collars oversize so that when they shrink they will come back to about the size that is desired, and to apply that to gray goods which subsequently must be bleached, and in which bleaching operation the shrinkage occurs, and

in a process which could not be applied to colored goods of any kind because the bleaching would of course destroy the color; and the process in which we are interested and hope to patent is a process in which we can handle and do handle goods that are dyed either in a cotton stage or in the yarn stage or in the piece goods stage, and applicable to material in which a pattern may be put on to the material by a printing operation so that you can have pictures of stars, birds, or what you please, and you can carry it through all of the manufacturing operations with all of the advantages which inhere in the fact that the material has the regular sizing of starch and gum and tallow, which as the gentlemen will explain does facilitate all of the manufacturing operations—that is what it is put there for—and still despite that fact, at the end of the sewing and other similar operations there is this shrinkage which is effected in a moment or two
and exactly of the right amount in both directions by
51 this wetting with the wetting out agent, and that in
turn followed by drying and setting the cloth in
presses which press the shirt completely, what they call "flatwise", and with none of the stretch which most of the present operations used in shirt factories and ordinarily given them.

Since I have told Your Honor so much about it I would like to show you a sample of a shirt as it is cut and sewn together before this final 2-or-3-minute wetting and shrinking, and then identical shirts after. I have here a sample of the shirt after all the sewing operations have been completed with these oversize pieces carefully adjusted to the shrink in the two directions, and if Mr. Wupper will help me hold that so Your Honor can see, you will see that it is a substantial factor that we are talking about, it is not an imaginary item. I do not know what the difference may be in the length across there from sleeve to sleeve, but I imagine it is six or seven inches, something of that sort.

Now, the new thing as it seems to me is to have—if you want to look at it that way, and in a measure we must—I think it is a recognition of the shrinkage which has always

been recognized as the problem to be overcome; the selection possibly from the domestic science book that you could cut your material too large; how much to add was a matter that Mr. Cluett thought about and applied. He determined that it would be, in the example that he gives, 0.55 of an inch per yard weftwise with a given material; it
52 would be something else with some other, I recognize that; 2¼ inches per yard warpwise. He turned that to account however by putting crinkle into the cloth in both directions corresponding with that and did not get immediate shrinkage. He substituted crinkle for shrinkage, delivered crinkled cloth, and made it necessary to make the shirt of that crinkled cloth, which has certain difficulties or disadvantages, more especially in the manufacturing processes, to some extent, also in the manner which he recognizes, namely, that after that shirt has been made of that crinkled material, the first time or two that it is laundered it will actually enlarge itself so that for a time or two, two or three or four wearings, it will be too big; gradually the "spontaneous shrinkage" as he calls it will catch up with the straightening of the crinkles, and eventually you will get a shirt which theoretically at least could be of exactly the size; theoretically, that is. There is that, and you could go to the Cluett patent and say "We will pick from that the idea of predetermining the exact amount of shrink."

The Court: Predetermining the amount seems to me to be something that anybody would do, any way. I can see no invention in that.

Mr. Williams: What we do is to predetermine that amount, cutting our pieces accordingly, making allowance for the shrinkage in the two directions. We make
53 our shirt not of preshrunk material, which is sleazy and difficult to handle. Cluett recognized that and substituted this crinkled material in which he keeps the sizing to some extent to hold the crinkles in it, so that it does have some "body" as I think the people in this trade call it, and then this very rapid shrinkage, which is true shrinkage as distinguished from the crinkling which Cluett

substitutes for shrinkage temporarily, we have accomplished that by the use of this wetting out agent in two or three minutes. We then press without any stretching and in such a way that the shrinkage which has been put into the garment in this two or three minutes will be retained in its entirety, and it does not determine whether invention or not was involved; that is for some man, a judge, to say; I recognize that; but as bearing upon the possible question as to whether or not invention was involved I suppose it would be hard to find an art older than that of making garments. Certainly the art of making shirts to which this is not limited is an ancient art, and I do not believe that it was possible to go and buy a ready-made shirt before this so-called "Relyonsize" shirt of this patent application could be bought, which would retain the size in which it was bought, and people like them and they do buy them. We have some evidence of the large number and increasing number of sales, and we want to produce the evidence covering perhaps in a little more detail the matters that I have outlined to you.

The Court: I am willing to hear the evidence, but
54 frankly I do not think there is any invention in this.
I can see no invention in this, at all.

Mr. Williams: Well, one does or one doesn't, and courts recognize the difficulty of formulating a rule or a statement of what does or what does not constitute invention.

The Court: Oh, yes. It has always been difficult to determine what is invention, of course.

Mr. Cochran: If it please Your Honor, Mr. Williams has admitted that it was old to make things oversize in general, and I think his point is that it was invention here to make them just the right amount of oversize in each direction. Now, that seems to me just to be another way of saying, "Do the thing right that you have been doing in the past."

As far as the matter of measuring precisely the amount of the shrinkage and allowing precisely for that amount of shrinkage is concerned, the article in TEXTILES AND CLOTHING, to which he has referred, says that you do.

"You take a sample of material and measure it, then wash it, press it, and measure it again to determine the percentage of shrinkage."

Of course that is done to determine the precise amount of shrinkage and to make the precise amount of allowance for it.

Now, I only cited the Cluett patent for one purpose. That was to show that it was old to measure in both directions, warp and weft, while this previous article I mentioned from TEXTILES AND CLOTHING does not say "measured in two directions". I take it that anyone doing that would measure in both directions any way, naturally. 55

There are many steps set forth in the claims here, but most of those steps, for instance, determining the shrinkage first, and things like that, are not a process of making clothing. That is a matter of preliminary investigations, and many of the other steps, such as making the cuts according to a pattern, and sewing them and then pressing them—those are just the common and ordinary steps of making any garment, and they certainly could not add anything to the patentability of the claim.

Now, as to the testimony which Mr. Williams proposes to put on, if his opening statement is an indication of that, I would say that I could concede practically everything he said in his opening statement, except as to his conclusion that this is patentable, all about the preparing of the fibers for weaving of the cloth and the weaving and the processing of the cloth, how all that is done, the machines that make the shirts, and how they operate—I don't think that has any bearing on the question of patentability here, and I could concede that what he says, about those things is true, if that would shorten the handling of this case.

The Court: Conceding everything you say except the conclusion as to patentability, it is my opinion there is no invention.

56 Mr. Williams: I know that this thing has had a great commercial success, without advertising.

The Court: I think that is sometimes considered when the question is quite doubtful; otherwise, not.

Mr. Williams: I know that, and I cannot say more about that. I know what the law is on that, and I think Your Honor knows. It is a factor which courts weigh in cases of doubt.

We should like to make a record of the facts. I have stated them fairly fully, and Your Honor has been patient in hearing that. Still, I have not—

The Court: Well, what more do you need than your own statement? Admitting that to be true, in my opinion there is no invention.

Mr. Williams: I would like to have a record as to the relative difficulties or the difficulty of burdening the manufacturing operations on this more or less crinkled material which results from the Sanforizing of piece goods, as compared with our process.

The Court: How long will that take you to put in your testimony? It has taken you an hour and a half to describe it.

Mr. Williams: Well, I thought it would. I thought it would take two hours to put in the testimony.

The Court: I do not think time should be taken up, when your own statement in my opinion settles the case.

Mr. Williams: The thing is of a good deal of importance to our people, and I do not mean to threaten 57 Your Honor with an appeal, but I think we have the right of an appeal.

The Court: Well, you have a right of appeal, of course. If I am wrong on your opening statement the Court of Appeals could reverse it.

Mr. Williams: I beg pardon?

The Court: If I should be wrong in dismissing it on your opening statement the Court of Appeals could reverse it.

Mr. Williams: I would feel more comfortable if the people who know more about it than I do told about it.

The Court: Very well. Put on the testimony. I will hear the testimony. Now, proceed as rapidly as you can.

(Thereupon the plaintiff, to maintain the issues on his part to be maintained, offered the following evidence:)

Plaintiff's Evidence

Mr. Williams: Let me in the first instance offer in evidence what I think of as the certified copy of the file wrapper and contents of this application, showing the proceedings before the Commissioner of Patents. May we have that marked as plaintiff's Exhibit No. 1?

Mr. Cochran: No objection.

(The certified copy of file wrapper and contents was marked as Plaintiff's Exhibit No. 1 and was received in evidence.)

58 Mr. Williams: Then we offer in evidence the Ainslie patent 1,480,541, which was cited in the Patent Office, and we ask that that be marked Plaintiff's Exhibit No. 2.

(The Ainslie patent 1,480,541 was marked as Plaintiff's Exhibit No. 2 and was received in evidence.)

Mr. Williams: The Watson publication which has been referred to, title page and page 212, we will ask that they be marked as Plaintiff's Exhibit No. 3.

(The title page and page 212 of the publication entitled "Textiles and Clothing," by Kate Heintz Watson, were marked as Plaintiff's Exhibit No. 3 and were received in evidence.)

Mr. Williams: The Cluett patent 1,861,423 which was cited before Your Honor by notice. It was not cited by the Patent Office. We ask that that be marked as Plaintiff's Exhibit No. 4.

(Cluett patent 1,861,423 was marked as Plaintiff's Exhibit No. 4 and was received in evidence.)

Mr. Williams: And another earlier Cluett patent; I am not sure that Mr. Cochran is familiar with that, but I think that simplifies an explanation of the theory of the one that has been offered. We will ask that that be marked as Plaintiff's Exhibit No. 5. That is the Cluent patent 1,944,001.

(The Cluett patent 1,944,001 was marked as Plaintiff's Exhibit No. 5 and was received in evidence.)

Mr. Williams: Now, Mr. Mayer, will you be sworn, please.

59 **Herbert G. Mayer**, a witness produced on behalf of the plaintiff, having been first duly sworn, was examined, and testified as follows:

Direct Examination

By Mr. Williams:

Q. 1. Will you give the reporter your full name, please. A. Herbert G. Mayer.

Q. 2. And where do you reside? A. 222 Maple Hill Road, Glencoe, Ill.

Q. 3. And how old are you, Mr. Mayer? A. I am 45.

Q. 4. And what is your occupation? A. I am president of the Reliance Manufacturing Co.

Q. 5. What is the business of the Reliance Manufacturing Co.? A. We are manufacturers of cotton garments, work shirts, and so forth.

Q. 6. What is it mainly that you manufacture? A. One of our principal products is work shirts.

Q. 7. And what do you mean by "work shirts" as distinguished from other shirts? A. Well, it is the shirt that a workingman wears to work in as distinguished from a white shirt.

Q. 8. Of what kind of material is the work shirt ordinarily manufactured? A. Of chambrays or coverts.

60 Q. 9. Are they colored or not colored? A. They are colored.

Q. 10. How are they colored? A. Well, the yarn is colored before it is woven. In some cases the cotton is colored before it is even woven into yarns.

Q. 11. Are there any other ways in which the material is colored? A. Yes, there are some work shirt materials, the khaki cloths, and so forth, that are dyed in the piece.

Q. 12. Any other? Printed? A. No, I wouldn't say—well, there may be a few fabrics that are printed, working cloth fabrics, that are printed.

Q. 13. Printed with colors? A. Yes, dark colors.

Q. 14. You are, I take it, the Herbert G. Mayer who is with Mr. Robert Seyfarth one of the applicants for the patent involved in this suit, and in which your patent application had serial number 121,552, filed January 21, 1937? A. I am.

Q. 15. Will you please state briefly the problem toward which your invention and Mr. Seyfarth's—I will call it "yours" for brevity's sake—was directed, or which it was intended to solve. A. Well, we had been making
61 work shirts for a great many years, over thirty
years, and we make them oversize. Sometimes we would make the neck a half inch oversize, and so on; but we knew that after the customer bought the shirt, that they were in a great many instances unsatisfactory because of the undetermined amount that they would shrink. Sometimes a size 17 would shrink down to 15, and the shirt sleeves, I have seen them on people that are two or three inches, maybe sometimes four inches too short, and of course as a result of that, why, we were anxious to get a garment that we could deliver to the store and the storekeeper could deliver to the customer, and when the customer wore it the first time it would be the same the first time, the second, the third, and the fourth.

Q. 16. Are you familiar with any efforts which had been made prior to your invention to overcome that difficulty?

A. Well, the only one that—when I first started, there wasn't any shrunk material. As a matter of fact there wasn't any Sanforizing process out when I first started, but of course subsequently there did come in the Sanforized cloth. They had got up some water-shrunk cloths which one of the mail order houses had sold, but it wasn't satisfactory. There hadn't been any garment that really had accomplished anything when I first became interested in the problem.

Q. 17. You were familiar with making garments I think you have said and work shirts in particular roughly oversize? A. Yes, we did it ourselves. 62

Q. 18. And in what form did you sell them? A. We sold them oversize, in finished garments. We just haphazardly cut size 15½. We would make it say 16¼ or 16. But I might mention one thing, that in the sleeves of the shirt, if you would cut the sleeves of a shirt large enough oversize to allow for the shrinkage you couldn't have sold the shirt, because the customer when he would have bought the shirt would have thought, "Well, there's something wrong," because he never knew how far the sleeves actually shrank, and he would have sent the shirt back to the merchant because he would have thought there was something wrong with the build.

Q. 19. Because they would be too long? A. They would be too long, particularly if you had a 38-inch sleeve.

Q. 20. Won't you explain how you arrived at the solution of the difficulty which is described in this patent application here involved. A. Well, the first thing I did, I tried to get all the literature there was on the subject, particularly in regard to cotton fibers, and I found that there was no literature that would really answer the question. I wanted to know what a cotton fiber was like, what it did, whether it was soluble in water, and whether it actually shrank; and I tried to find literature, and not finding it, I got into direct touch with the Massachusetts Institute of Technology and the Lowell Textile Institute, and 63 asked them the point-blank question, whether a cotton fiber was soluble in water or whether a cotton fiber would change in size if it was first taken just as it came into the plant, then put into water, and then taken out, whether there would be any change in size; and I got the answer back that cotton was nonsoluble in water, which was exactly what we had anticipated, and as a result of that our first experiments were rather surprising experiments.

We took for example a foot square of cloth, just any cloth that came from the mill, and just by kneading that cloth, all of which released the starch and the glue on it automatically, that piece of cloth with just kneading it with your hand shrunk very perceptibly right in front of your eyes, so as a result of that we went to our next experiment, and we tried to make a hydraulic machine and tried to compress by water or with the hydraulic pressure the cloth itself, but we found in that experiment that the pressure was too great at the core, so that we had a piece of cloth had a core that would expand when it was wet, and in the middle it was just about right, and towards the ends it wasn't enough, because you couldn't slip the pressure all the way around the complete core, so we abandoned that experiment.

Q. 21. In what form did you—

Mr. Williams: Do you mind if I make these questions a little leading?

64 Mr. Cochran: No.

Mr. Williams: If you do at any time stop me. We will get along faster.

By Mr. Williams:

Q. 22. You are talking now about an experiment applied to a roll of cloth? A. That is right.

Q. 23. Wound up on a wooden core, and it was the part of the cloth nearest the wooden center that was compressed too much, and that near the outside of the roll not enough? A. That's right.

Q. 24. And that in the middle about right? Did you consider experimenting with the idea of shrinking the piece of goods by wetting prior to making it into a shirt? Did you give that consideration? A. Well, we thought about it, but the problem is this: Supposing we cut 300 dozen work shirts at once, which is our standard cut.

Q. 25. How many? A. 300 dozen. That is 3,600 shirts at one time. That means that we have got almost five miles of cloth laid up, and the problem of wetting five miles of cloth and then drying it was one that practically made us throw our hands up, so we abandoned that idea of trying to handle a piece of cloth, whether it was five miles spread out
or whether it was laid up on the table, and then try
65 to get the water to penetrate all through a half to a
foot thick of cloth. Even if we would have got it
wet I don't know how we would have got it dry. So we thought about it, but we never actually experimented with wetting the cloth itself. You see in this hydraulic pressure experiment that we ran we had a rubber cover over the cloth so that the water itself did not touch the cloth, it was just the pressure, the hydraulic pressure, the water, that compressed the cloth.

Q. 26. And you would put the cloth, sealed up in a rubber tube— A. Yes, that's right.

Q. 27. —and then apply pressure on the outside of the tube to compress it? A. That is right.

Q. 28. Then what next did you do? A. Then we rigged up a machine, having in mind this little experiment where we could shrink cloth by just kneading it in our hand. We thought maybe we could get an agitating machine that could take the finished garment and that would loosen up the starches and tallows in the cloth itself, and that that would release the fibers, and we could get shrinkage that way, and shrink a shirt without putting water in it; and after analyzing that and trying it out we found that there wasn't
anything that would do. The beating would beat the
66 shirt to pieces before you got the starch loose, so
that had to be abandoned, and you couldn't do any-

thing with that starch. You couldn't release those fibers. We tried even to get substitutes for water so we wouldn't have the problem of taking the water out, but we found that we couldn't get anything that would release the fibers in the cotton other than water, so that is what finally led us to the problem that the only way we could handle the thing was to take the finished garment which was at the right point as far as the public was concerned, rather than taking it in any intermediate steps with the piece goods or even prior to the finishing of the piece goods, or after half manufactured, for the simple reason that if you do that you are going to have additional shrinkage the minute you start manufacturing or pulling or putting tensions on a garment after you have tried to set it in the condition where it should be when the public is to get it; so we took it at the last step after the manufacture of the garment itself had been completed, and then we overcame the difficulty of having the water go into the garment, by getting a penetrating agent and controlling that process, because we had to, in wetting that as distinguished from washing, or from any other process, our problem there was to release every one of the fibers so that every one of the fibers in the cloth could have its own independent action, and so that instead of like
washing, where it takes three or four times to get
67 the garment down to the size, or sometimes ten times,
with that particular penetrating agent, and with that
agitation, we were able to get the garment in two or three minutes down to the size that it would be after you made say five, six, or eight or ten washings, without injuring the cloth or without taking the finish of the cloth off. And then of course the subsequent step was, after we had the cotton fibers straightened out, we had to get special machinery to handle that, so that we would not in any way distort those fibers, and that's where we consulted that American Laundry Machine. They told us it couldn't be done, and we are doing it any way. We are producing the product. They said you couldn't press more than one or two, or you couldn't press two surfaces at once or to form a garment

on a flat press and get a commercial job, yet that is exactly what we have been doing ever since we have been running this Relyonsize process, and the reason that has to be done is because the minute you would start putting it on ordinary presses you would immediately start putting a new tension in and pull the shirt out of shape again, and then if you would set it when you pulled it out of shape, you would have shrinkage the next time it was washed.

Q. 29. When was it that you began making shirts in accordance with the disclosures of this patent application? A. I think the first ones were the latter part of 1936, made a few, then.

Q. 30. Can you state what were the quantities of 68 the sales of these Relyonsize shirts as you called them? And I presume by that you mean shirts made in accordance with the process of your application. A. Well, in '37 we sold 226,000, in '38, 383,931, and in '39, 509,000.

Q. 31. Did that entail any special advertising or advertising and pushing of those shirts as compared with other shirts that you were selling? A. It did not. As a matter of fact we did not run any special advertising campaign on that product.

Q. 32. Have you made any guarantee in connection with these shirts? A. Yes, we do. We make a guarantee that we will give another free if it shrinks.

Q. 33. Have you ever had to supply free shirts on that guarantee? A. Never have had to give one.

Q. 34. Now, you have been in the court room this morning and you have heard me tell the Court about this Cluett patent disclosing the so-called Sanforizing process, have you not? A. Yes, sir.

Q. 35. Have you had some experience in making garments or shirts, to confine it to that, out of material which is called Sanforized material and made in the manner disclosed in this Cluett patent, 1,861,423? A. Yes. We 69 also make shirts out of Sanforized fabrics.

Q. 36. Now, won't you compare the advantages and disadvantages of making shirts of Sanforized material and making shirts of the regular material. A. Well, the first process of making a shirt is of course spreading the goods on the table. The table is about 250 feet long, and with ordinary goods, the way they come from the mill there is no stretch in the goods when you lay it up on the table.

Q. 37. Why is that, briefly? A. Well, because they are pretty well set. The yarns are pretty well set and starched both ways, the warp and filler, and there's a little stretch, but it is negligible.

Q. 38. What do you mean by "sizing"? A. Well, I mean the starch that is put in the yarns while they are woven.

Q. 39. That is starch, entirely, that sizing material? A. Well, starch or any other compound, tallow, or whatever they use.

Q. 40. All right. Now, won't you go back to the comparison. A. Well, in your ordinary goods, your warp and your filler yarns are more or less glued together, so it is almost like a solid mass, and in laying that up 200 or 225 feet long there is very little if any stretch, whereas if you lay
70 up a Sanforized piece of goods, because of the fact that the warp and the filler have been more or less loosened through the process, there is slippage there, and when you lay up about 225 feet long like that you are going to, you can't help but get a gain, no matter how careful you are. Even the weight of the goods itself will give you a gain, and then of course when you come to cut those goods—

Q. 41. When you say it will give you a gain, what do you mean? A. Well, I mean instead of spreading it, if the goods was 1,000 feet long, they will spread out 1,033 feet. Well, of course, if they spread out 1,033 feet, whereas they should only cover patterns for 1,000 feet, you have got an extra yardage there that the 33 extra yards should be in the shirts, but they are not, so therefore when you make the shirt out of that 1,000 yards, when you should have used 1,033 yards, why, the shirt has got a little shrinkage left in it.

Q. 42. Because the material has been stretched in that laying out process as you call it? A. The material has been stretched.

Q. 43. What, briefly, is the laying out step? A. Well, that is putting it on a spreading machine. It has got four wheels, and you put your roll of cloth on the machine, and a man pushes the carriage up and down the cutting table, which runs anywhere from 200 to as far as 250 feet.

71 Q. 44. And it lays the material out on this cutting table, layer upon layer. How many layers thick? A. Well, we go up to 300 ply, sometimes go up as high as 500 ply on real fine materials.

Q. 45. All right, now, further relative to differences in the manufacturing process, depending upon whether you are using this pre-shrunk Sanforized material according to the Cluett patent or whether you are using regular material. A. Well, on the Sanforized material, the men that cut that material experience more difficulty.

Q. 46. Can you keep your voice up a little. A. They experience more difficulty because of the slippage of the yarns, and the knives have to be sharpened a great many more times when you cut Sanforized goods than when you cut ordinary goods.

Q. 47. Why, briefly, is that? A. Well, it is on account of the slippage in the yarns.

Q. 48. The sleaziness of the material? A. Sleaziness, yes. It will slip very much, while the others are fast. One is like cutting into a solid surface, the other is cutting into a surface that keeps walking away from the knife.

Q. 49. Now, in the further steps, what differences are there? A. Well, when you get through cutting of course
you start on your turning operations or turning your
72 creasing; for instance, the collars, the collar bands,
the cuffs, the pockets, the pocket flaps are creased in a regular creasing machine so as to give them a sharp outline, and on ordinary cloth we can crease two at a time and it will hold itself creased whereas on Sanforized goods we have to crease them one at a time, or it takes twice as long,

because it won't hold its crease the way the ordinary goods will.

Q. 50. And in what further operations are there differences, if any? A. Well, the differences occur through all the sewing operations because the girls have a harder time. The more sleazy the material is the harder it goes through the folder, and the more difficulty they have in putting it through the folder. The firmer the goods are the easier it is to feed, and that would be true on almost all the sewing operations, the front piece, the button strip, and the side seams and the yoking, and practically every sewing operation with the possible exception of button holing and button sewing, where it would not make much difference, because there it is just held at a stop, and so the particular material is not important, but all long seams or pockets or collars or anything like that it makes it more difficult.

Q. 51. Now, after you have finished the sewing operations on a shirt made of the Sanforized piece goods, what do
you do with it? A. We just put that in a buck, and
73 out it goes—press it, buck it, and box it—fold it,
rather and put it in a box, and sent it out.

Q. 52. Now, as compared with a shirt made in accordance with the process of your application, what are the characteristics of that shirt made from the Sanforized material? A. Well, the Sanforized material, it will shrink a little bit. There is a tolerance allowed of about one percent, and it will usually take that tolerance of one percent or it may even gain in sizes in the middle for a little while, but it will shrink, whereas the shirt that we put through the Relyonsize process, our tests have shown that that shirt will not shrink, that it will hold its true size all the time.

Q. 53. What about the stretch or lack of stretch of the material in the sewing operation? Supposing you are carrying on those sewing operations on material which is what you have spoken of as the "regular" material and containing the normal sizing, does that material require any additional and permanent stretch in the sewing or other manufacturing operations? A. Well, you stretch every ma-

terial a little, regular material or any other material, because when you are sewing with a sewing machine that is going 4,500 to 5,000 R. P. M.'s and the operator is hanging on to the other end and feeding it in, and she has got to keep her contact, feeding firmly, and the material allows the stretch. Now, your ordinary make, you would get
74 practically no appreciable stretch, but when you start a piece of material that is loose at the warp and at the filler yarns and she starts to pull on it she gets considerably more stretch. I mean you can probably get an appreciable stretch, as much as an inch in 32 inches. You can take a piece that you start out where it is 32 inches long, and the girl can finish at the end of it with a 33-inch piece.

Q. 54. Does that happen with this pre-shrunk material as it is called? A. It does. We know that. We have to cut it shorter for that reason.

Q. 55. And can you say whether or not that stretch which is put into that so-called "pre-shrunk" material—I mean material made in accordance with the disclosure of this Cluett patent—does that remain in the shirt when it is folded up and sold? A. Not after, when it is worn. Well, in other words, due to the type of machinery that we must use and every other shirt manufacturer must use, you must put that stretch in it, unless you would want to sew it individually by hand, which would be commercially impossible, and consequently if you are stretching out your goods an inch it stands to reason that when you give it a chance to go back, it is going to go back that inch.

Q. 56. Well, when you sell it, does it have any
75 stretch? A. It has got the stretch in it, not because we want to put it in, but because we don't know how to manufacture it any other way.

Q. 57. But it is there? A. It is there.

Q. 58. And then after it has been sold and is laundered, does the shrinkage take up that stretch in one way or another? A. Yes.

Q. 59. So it becomes smaller? A. When the cotton fibers are all released and that starch is out of them, the shirt is going to go back to its normal size, and whatever stretch you have put in, it is going to dispappear, and so they call that "shrinkage". Of course, I maintain that there is no such thing as shrinkage. It is just the readjustment of the cotton fibers. There isn't such a thing as shrinkage, technically speaking.

Q. 60. In this Sanforized material, made in accordance—

The Court: Pardon me just a minute.

By the Court:

Q. 61. What do you mean by "shrinking"? A. I mean by "shrinkage", when something becomes smaller. Now, if something changes size, that doesn't mean that it shrinks. If it gets wider it takes on a different dimension, but when a piece of cotton cloth—you call it "shrinkage", I know, for popular purposes, you have got to admit
76 that it is shrinkage, and I will admit it, too, for popular purposes.

Q. 62. You mean the total volume is changed in order to have a shrinkage, is that your idea? A. Well, my idea is, if all of the material and the weight is still there but it has changed its shape, there is no shrinkage. If you take a rubber it will stretch, but it is still the same amount of rubber that is there.

Q. 63. You do not claim that your process prevents shrinking? A. Well, I— now— I want to think a minute before I answer that.

Q. 64. I understand what you mean. It doesn't prevent shrinking in the popular sense of the word "shrinking", then? A. Yes. You could take our garment and you could knead our garment into a different shape, because of the very fact, if the cotton mill can do it and the sewing factory can do it—the fact that you have put it in the right shape once doesn't mean that it can't be distorted again, and then if it is distorted once it will shrink the next time.

The Court: I understand what you mean.

A. (Continuing) Yes, it can be done, definitely.

By Mr. Williams:

Q. 65. Now, I think you said that with the Sanforized goods, the sewing operations are of a character such that you inevitably get some stretch or bring about some
77 stretching. It is hard to know what words to use, now, when we are thinking of "shrinkage" sometimes in the popular sense and sometimes— A. Well, I didn't mean to confuse anybody.

Q. 66. No, I know that, but you have said that when you sew this Sanforized material that the operations are of a character such that you necessarily give the material some stretch; I think you said as much as an inch in what was it, 32 inches? A. 32 inches.

Q. 67. Are there other differences which affect the manufacturing operations, and I mean differences as between what we have been calling "regular" material, and I mean by that, sized and finished material, and Sanforized material? A. Well, I don't know. I thought I had covered it, the cutting and in the sewing and in the putting it through your folders, and your turning machines, where it costs you about twice as much, and those are the only differences that I can think of now. I may have forgotten some.

Q. 68. What is the result of those differences? Is the manufacture of the one shirt more or less expensive than the other, and how does it go? A. It costs us a little bit more.

Q. 69. To what? A. To manufacture it of pre-shrunk goods than it does ordinary goods.

78 Q. 70. You have read this Cluett patent that was cited by the Patent Office, No. 1,861,423, have you not? A. Yes, sir.

Q. 71. Do you have a copy of it, there? A. No, I have not.

Q. 72. Do you have a copy of it in the room here somewhere? A. I got one, yes.

Mr. Williams: At what time, if I may inquire, does Your Honor adjourn?

The Court: It is usually 3 o'clock. I have another short matter I want to take up, that will take some little time, after that.

By Mr. Williams:

Q. 73. You have that patent? A. Yes, I have it before me.

Q. 74. From your reading—well, let me ask you, first, do you think you understood the disclosure in that patent from your reading?

The Court: Now, that is the Cluett patent?

Mr. Williams: Yes.

A. Most of it. I would say Yes, I think I do.

By Mr. Williams:

Q. 75. What is your understanding as to the thing that the process of that Cluett patent does to the cloth? In some detail, what is your understanding? A. Well,
79 he accomplished what I tried to accomplish by that
hydraulic pressure. He took cloth and he compressed it together, and he had a practical means and I had an impractical means. He presses the cloth so that he takes the warp yarns and if they are—he makes those warp yarns, compresses them together.

Q. 76. He refers here on the first page, line 13 I think is the beginning of the sentence, he says:

"The superficial contraction of the web is produced by pressure exerted in directions parallel to its surfaces; since by reason of the confinement of the web by the pressure maintained on its entire surface it can not wrinkle as a web or sheet in response to the contractile force exerted on it, the response to that force is by the component yarn systems within the web (one or both) of which the web is composed, which assume a more pronounced undulation or crinkle, contracting the web without wrinkling its surface. This may, for the sake of brevity, be termed shrinkage by compression."

And then elsewhere you will find references to this matter of crinkle, as for example in line 48 I think it is, beginning in 46, it says:

> "In its passage through the concave sector, the web responds to the contractile force by the crinkling of the
> 80 warp yarns."

and elsewhere throughout this specification. On page 2, in line about 107—no, it is prior to that—the sentence beginning—I guess it is away up at 91. Without reading all that, it comes down in line 103 to where it says:

"is accompanied by a corresponding shortening of the moist web, of which the yarn components (warp in this case) produces take up or shrinkage by undulation or crinkle." And then without calling attention to the many other places in which that pronounced undulation or crinkle is referred to, I wish you would state briefly what you understand to be the peculiar characteristic which is given to the cloth by this Cluett process, and having in mind particularly the characteristic which he refers to as the "pronounced undulation or the crinkle of the yarns" of the two systems, warp and web. A. Well, what happens to the cloth is, it is still—to the layman it has an apparent smooth surface, but this process accomplishes exactly what he says it will, and that is, that it takes those yarns and it gives them more of an undulation; in other words, it gives them a spring, so that they are matted together, and by the very fact of what he does to it, the minute you put a little bit more pull on that thing you can pull that thing out again the same as he pushed it in. In other words, if one force will push it in, the same force exerted in the opposite direction naturally will
81 take it out, and therefore it makes that piece of cloth
more difficult to keep from putting, from pulling and stretching, than it would an ordinary piece of cloth that was (you might say) solidly glued down.

Q. 77. Now, is it your understanding that this material, treated in accordance with the process of this Cluett patent

No. 1,861,423, has the separate fibers of cotton in a straightened position, straightened condition, such as you have referred to, or is it your understanding on the contrary that each fiber has assumed its contracted and crinkled formation? A. No, I think of that, under the Cluett patent, and all he claims is, that he treated the yarns as a rope, and he didn't pay any attention or try to pay any attention to the individual fibers in that rope. He was interested in contracting the ropes. I am calling the yarns "ropes" so as to make it more clear. His process looked to putting the ropes back so that the ropes that ran one way and the ropes that ran the other were the right distance, so that when each individual fiber that made up each one of those ropes had gotten to just you might say a state of rest, that he had compressed the ropes running both ways and the same size they would ultimately be, when all the foreign matter, starches and tallows, had been released, but if you want a real, true shrinkage, if there is any such thing—

82 By the Court:

Q. 78. He uses that word himself? A. What is that—"shrinkage"?

Q. 79. "Shrinkage". A. I know he does.

Mr. Williams: Well, there is no harm in referring to it by that name, for you know what it means.

The Court: No. We will consider that when you use the word "shrinkage" you use it in the popular sense.

By Mr. Williams:

Q. 80. There is a given quantity of material there, which does not change. It is the form which is given to it. You recognize that, of course? A. Yes.

Q. 81. And he recognized of course how the fiber can contract or expand in the plane of the web, as Cluett calls it. A. Yes. I think his treatment treats the individual, the strands rather than the individual fibers that go to make up our strands. On the other hand, our process looks to setting each one of the individual strands in position, or the fibers in position, rather than the strands.

Q. 82. And the difference in sewing operations is due to that difference in the characteristic of the material on which the operations are carried out, is it? A. That is correct.

Q. 83. Your sewing operations are carried out on
83 material in which the yarns are not unusually or
abnormally crinkled? A. That is right. You might say that we sew on a flat surface that has no give, right or left, whereas when you pre-shrink the material you get a basket weave that you can pull like chicken wire one way or another, and I think it is obvious that it is harder to sew on the material that can be pulled one way or another and that is sleazy than it is on a solid material.

Q. 84. I think you mentioned the fact that an early step in your operations is to determine or to predetermine the amount of shrinkage in each direction of the piece goods; that is, the maximum possible shrinkage or contraction in both directions, of the piece goods with which you are going to work? A. That is correct.

Q. 85. How, briefly, is that done? A. Well, we rigged up a machine that has a flat surface, and we put four of those stapling machines and anchored them firmly—as a matter of fact, about eight of them—two of them—two, four, six, eight, two on each side. Then we take a piece of cloth and set it in there where it is actually sewed, then punch the foot of the stapling machines. That puts a metal guide into the piece of cloth. Then we run that piece of cloth through our Relyonsizing process, take it back and measure the difference in the metal points, and that gives us exactly what
is going to happen to the cloth that we are going to
84 use ultimately.

Mr. Cochran: May it please Your Honor, of course lots of this testimony is irrelevant to the issues here, and I could object to lots of it. I will just make this general statement that in this particular case there is no question but what he has determined a percentage of shrinkage, and how he does it is of no importance here.

The Court: Yes, there is nothing in the claim on that, at all.

Mr. Cochran: I do not propose to make more objections right along, but I think that would apply to a good deal of what is being said.

The Court: Yes.

By Mr. Williams:

Q. 86. You do predetermine the amount of shrinkage accurately in both directions? I do not know whether you said what you do in connection with your patternmaking as a result of that predetermination. A. Well, of course the patterns are laid out so that wherever two pieces of cloth are to be joined together, so that one is on top of the other, like a collar band or the one top and bottom collar band, or like the yoke, we lay our patterns so that the threads in the two pieces of cloth will always run the same way, the warp yarns running the same way, and the weft yarns running the opposite way, because we know in
85 advance that there is a difference in shrinkage between the warp and the weft, and if we didn't do that, after we put it through our process, we would have one piece of cloth would be puckered and the other one wouldn't; so we don't do that on ordinary shirts. We do do that on these shirts, our Relyonsize shirts.

Q. 87. Without going into too much of that detail, do you in making these Relyonsize shirts as you call them—you have—I don't know whether you have a name for them. Do you have patterns corresponding with the sizes of the pieces of the shirt when it is of the finally desired size? A. Well, our patterns themselves are measured, but we have the patterns that we know what our finished dimensions are to be, and then from those finished dimension patterns we make up new patterns, depending upon the type of cloth that we are going to use, and depending upon the percentage of shrinkage in each end which have to be added to the patterns proportionately, but we are always shooting for a definite finished dimension for Relyonsizing, and from those as a base is where we make up our patterns.

Q. 88. Well, now, in making up the patterns from which the marking or the cutting is done, how, if at all, do you take account of this predetermined amount of shrinkage in both directions, both the warp direction and the weft direction? A. By adding to each piece of the pattern enough so that having in mind the finished dimension that we
86 are aiming at, we add to each direction and dimension of the patterns the amount of shrinkage that is indicated by the test, so that for example in one pattern you might have to add two inches one way and an inch the other way, or you might—

Q. 89. No, per yard. A. Yes.

Q. 90. Then how are those? Well, have you got any name for those patterns which have been enlarged in both directions, any special name? A. Well, we would call them "patterns" or "charts", where you lay them out on the chart that you spread on the table.

Q. 91. Mr. Bard has here a sample of those patterns and of those charts, has he not? A. I think he has, yes.

Q. 92. And of the cutting machine? Mr. Bard is connected with the Reliance Company? A. Yes, Mr. Bard is.

Q. 93. What is his position or occupation with that company? A. Mr. Bard is vice president in charge of all manufacturing.

Q. 94. And is very familiar with the manufacturing operations, is he? A. A great deal more than I am, yes,
87 the details of the manufacturing.

Q. 95. Now, there are two things here I would like you to identify, if you can. Will you look at these things and state if you can what they are? A. Well, the first and larger square is a piece of cotton, covert cloth, the way it was delivered to us by the mill and cut for 36 inches square, and the second piece was taken off the same bolt and run through the Relyonsizing machine.

Q. 96. How big was that when it was taken off the bolt? A. That was exactly the same size as the first piece.

Q. 97. You say it was taken off the same bolt? A. Off the same bolt, and the second piece, which is the smaller one, now, was run through the Relyonsizing process, and that piece as you see it now is approximately I guess about two inches roughly narrower in the width and about 3½ to 4 inches shorter in the length.

Q. 98. Does that represent the relative contraction, or I will use the word "shrink" in its more popular sense? Does that represent— A. That represents the results of Relyonsizing a fabric or a shirt, and this fabric if it were taken to a commercial laundry would not change in size.

Q. 99. That is the smaller one of the two? A. Un-
88 less it were subjected to unusual stresses or strains,
but just the ordinary laundry process would not
change the size of this, or the home laundry wouldn't.

Q. 100. Now, the one that you are talking about as "this" is the smaller one of the two? A. That is correct.

Mr. Williams: Let us have those marked as Plaintiff's exhibits 6 and 7. Let us have the larger one marked 6-A and the smaller one, 6-B.

(The larger of the two pieces of covert cloth referred to, marked as Plaintiff's Exhibit 6-A, and the smaller one, marked as Plaintiff's Exhibit 6-B, were received in evidence.)

By Mr. Williams:

Q. 101. Do those two pieces of covert, the larger one, which is now marked 6-A, and the smaller one, which is marked 6-B, do they represent the amount of shrinkage which would ultimately occur after a number of laundering operations on the shirt, per yard of material? A. That is correct.

Q. 102. And in this instance then you have said it is in the neighborhood of 2 inches per yard in width and 4 inches per yard in length. Now, you have here samples of another material, chambray. Will you look at these and state what they are. A. Those are similar to the two covert samples, and were treated similarly, and the results are the same, except that in the case of the chambray, the 89 smaller piece has only changed size approximately an inch in the width and about 2½ inches in the length, which is due to the different stresses and strains put in the fibers in the weaving of a chambray cloth as against the stresses and strains put into a covert cloth. If you would permit me, I could tell you one reason. You see in the covert cloth they have got twisted yarn that gives you that mottled effect, and they twist that yarn a little harder and they put a little bit more stresses and strains on that. Therefore, when you come to let the fibers go back into their natural state you get a larger change in size.

Q. 103. Do these two pieces of chambray to which you have just referred represent the amount of ultimate, final shrinkage which could be expected in a garment, and in inches per yard? I mean the final shrinkage resulting. A. Out of that type of chambray, yes.

Q. 104. And how many launderings would it require, ordinary laundering operations, at home or at a steam laundry, would be required to reduce the covert cloth to the extent represented by 6-A and 6-B, or in the chambray? A. It would take at least six—five, six, possibly seven; but I do not think you would get the complete shrinkage in five, in less than five launderings, and I think that would be probably true of the chambrays, too.

Mr. Williams: Let us have them marked, and we 90 offer in evidence the larger sample of chambray, having that marked as Plaintiff's exhibit 7-A, and the smaller one, as Plaintiff's Exhibit 7-B.

(The larger piece of chambray cloth, marked as Plaintiff's Exhibit No. 7-A, and the smaller one, as Plaintiff's Exhibit 7-B, were received in evidence.)

(Whereupon at 3 o'clock, the further hearing of said cause was adjourned until tomorrow, Tuesday, October 15, 1940, at 10 o'clock.)

91 * * *

Washington, D. C.,
October 15, 1940.

Transcript (Continued)

Pursuant to adjournment, the above entitled cause came on for further hearing before the Honorable Jennings Bailey, one of the Justices of the said Court, sitting in Civil Division No. 6 thereof.

Appearances:

(Same as previously noted)

---

92 **Herbert G. Mayer**, a witness for the plaintiff, resuming the stand, was examined further, and testified further as follows:

Direct Examination (Continued)

By Mr. Williams:

Q. 105. I show you what appear to be a pair of shirts. Can you state what they are, please? A. The shirt that has the label on it "Relyonsize, another free if it shrinks," is a shirt that has been put through the so-called "Relyonsizing" process, and is a shirt that will not shrink when it is laundered. The other shirt, which has no such label on it, is a shirt which has been made up in the regular—in the exact same manner as the shirt with the Relyonsize label, except that the first shirt, without the label, has not been put through the process and has not been shrunk, and will shrink considerably after it has been laundered.

Q. 106. Do you know exactly or approximately what the difference is?

The Court: Oh, what is the use of taking up all this time? He has those, there.

Mr. Williams: I think Your Honor is right about that. We offer in evidence the shirt without the Relyonsize

93 label, and ask that it be marked Plaintiff's Exhibit 8-A and the one with the label, asking that that be marked Plaintiff's Exhibit 8-B.

(The shirt referred to, without the Relyonsize label, marked as Plaintiff's Exhibit 8-A, and the shirt with the label, marked as Plaintiff's Exhibit 8-B, were received in evidence.)

By Mr. Williams:

Q. 107. And look, please, at another pair of shirts.

The Court: I think you have offered sufficient evidence on those. I will not permit any more.

By Mr. Williams:

Q. 108. Have you read and do you understand the Ainslie patent No. 1,480,541? A. Yes, I have.

Q. 109. Could the process described in that patent be applied in the case of shirts or garments which are colored, when finished? A. No, it could not.

Q. 110. Will you explain briefly why not. A. Well, for two reasons. In the first place, you cannot dye or bleach a shirt that has been colored, after it has been made up. You must have the dye or bleach or the priming matter on the shirt before it is manufactured, because there is no art or machinery that will dye or bleach or print shirts after they have been made up into the shape of a shirt as distinguished from a continuous band that a piece goods 94 is made up in.

Q. 111. Does this Ainslie patent disclose any method or means for giving a garment in advance of its sale the precise dimensions which it will have after a succession of washings or launderings sufficient in number to eliminate the possibility of any further shrinkage? A. It does not.

Q. 112. Why not? A. Well, all the Ainslie patent describes is simply cutting some blanks, oversize patterns, and then dyeing and washing them, and the net result of that patent or of the process there would be simply to produce a garment that would have some of the sizing taken out, but without any relationship to further shrinkage.

Q. 113. Does the Ainslie patent take any account or make any references to shrinkage in more than one direction? A. No, it does not.

Q. 114. Have colored work shirts ever been manufactured in accordance with the method described in the Ainslie patent and been sold, in so far as you are aware? A. Not to my knowledge.

Q. 115. Have you had an opportunity to learn and to know whether or not they have been so manufactured and
sold? A. Well, we are probably the largest manu-
95 facturers of work shirts in the country, and we travel
men in every State, all the States.

Q. 116. Will you keep your voice up. A. We travel men in almost all of the States in the United States, and we try to keep up to all of the different types of shirts that are manufactured, whether they are manufactured by us or by competitors, and we are continually in touch with the trade, and I firmly believe that I would know of any such garment if there had been any.

Q. 117. Do you make it a part of your business to know? A. It is a part of our business to know, to keep up to what the trade is getting.

Q. 118. You say that your company is you think the largest manufacturer of work shirts. Do you have factories? A. We have factories. We have 16 factories, located in four or five States.

Q. 119. I would like to refer now to this book, entitled "Textiles and Clothing", by Watson, and to the fourth full paragraph on page 212, and to the sentences of that paragraph, the first of which reads as follows:

> "Shrinking of material before making is desirable in wash goods which will be laundered soon."

Will you state whether or not such a procedure is feasible or practical or economically possible in the manufac-

ture of garments such as work shirts. A. It is not
96 possible, because of the volume of the cloth that goes into the shirts. The wetting and the drying and the handling of the cloth would make it impossible, too.

Q. 120. The next sentence says:

"Wash materials which will be worn a good many times before washing should not be shrunk, as wetting removes or disturbs the finish, and they will then muss or soil more easily."

What have you to say relative to that sentence in so far as its applicability to the manufacture and sale of garments such as work shirts is concerned? A. That is a perfectly true statement. If you do wash a fabric and in washing you take out, which you would, an ordinary washing would take out a substantial part of the sizing, which would automatically destroy the finish, therefore your finish is a good part of the stretch of the fabric, and by taking that out, you would not get the wearing qualities out of the fabric that you would if you left the finish in.

Q. 121. Now, in your process what do you do—do you leave the finish in, or do you take it out, in your process? A. Our process is distinguished from anything in either the Ainslie patent or this patent by the fact that we do not wash a garment. Washing a garment means removing dirt or cleaning the garment, incidentally taking a finish
97 out, and our process does not contemplate in any way, manner, or form a washing of the garment. What we do is use the water for the sole purpose of re-setting the fibers, keeping the finish in and re-setting the finish the way it was before. We do not wash a shirt.

Q. 122. Now, when a shirt is washed, is soap used? A. Ordinarily soaps of various kinds. They are always used when they wash a shirt if they are available, I suppose.

Q. 123. Do you use any soap or any detergent of any kind? A. We do not.

Q. 124. In your wetting step? A. We do not.

Q. 125. Now, why do you do so? A. In the first place, we are not washing a shirt. Our purpose in washing the shirt is solely to lubricate the fibers so that they can react and go back to their normal state, and the reason for penetrating of the shirt is so we lubricate all of the fibers, and not for the purpose whatsoever of removing anything from the shirt, even the sizing. We want the sizing to stay just where it is, but we want it lubricated, and then we re-set that sizing.

Q. 126. Referring to the shirt which has not been subjected to your wetting out step, and as represented in plaintiff's exhibit No. 8-A, does that material have in it the sizing and finish in which piece goods is finally made?
98 A. That is correct. Yes, it does have the sizing.

Q. 127. Now, will you compare that with the other shirt which has been subjected to your wetting out step and which is marked Exhibit 8-B, and state whether or not that represents the finish in part due to the presence of the sizing. A. That does have substantially the same sizing that the garment, 8-A, does. 8-B has substantially the same sizing.

Q. 128. Now, if that shirt had been subjected to a washing or laundering step or steps with the use of soap for the purpose of removing dirt, would it exhibit the finish and the presence of sizing which this exhibit 8-B represents? A. It would not. It would have a washed-out appearance. It would not look new, and it would not have the same feel that a shirt has with sizing. It would not have the properties that in that little booklet they caution against, if you are going to wear the thing a few times before washing, or before it is going to be washed, don't wash the shirt first. And the reason of that is that because when you wash the shirt, their idea, ultimately each washing removes a certain portion of the sizing.

Q. 129. Now, if in your process you did wash the shirt or launder it in the way, and with the use of soap or detergent, which is employed for the purpose of removing dirt, would the garment look and feel new, or would it look

99 and feel old and worn? A. It would look old, and it
would not feel new.

Q. 130. Which would be more subject to "mussing and soiling" as the language is in this Watson book? A. Well, if this shirt marked exhibit 8-B had been washed, it would have an old look, and it would not have the crisp feel that it has, and when it was worn it would be subject to the muss, and it would not wear as well.

Q. 131. How about the handling prior to sale? Which would be more subject to mussing and soiling, the shirt that has been subjected to your wetting out step, or a shirt which has been subjected to washing or laundering? A. The one that had been subjected to washing or laundering would be very easily mussed, compared to this shirt, or to a shirt which had not been processed.

Q. 132. Now, the next sentence of this Watson book reads as follows:

> "Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed, and measured again to determine the percentage of shrinkage."

Is it your understanding that that description applies to such a measuring as you employ, and does it refer to a wetting out step such as you employ? A. My judgment is that
it does not, that that simply refers to the haphazard
100 manner in which all garments from time immemorial
have been washed, just throwing them in soap and water, and washing them out, and pressing them, and it is obvious that you can't get any controlled shrinkage when you operate through what is ordinarily known as "washing".

Q. 133. Would you by a single washing operation—and by that I mean what is commonly and ordinarily understood by a "washing"—would that give you the amount of contraction or shrinkage which would result from a succession of wearings and washings or launderings of the garment? A. It would not. If we consider that the total shrinkage or contraction of the garment is 100, the first washing would not take out more than 50 percent. And if it were a home laundry it would not even take that much of it out of it. A commercial laundry might take out 50 to 60 percent.

Q. 134. What happens to a shirt or a garment made of what has been referred to as Sanforized material? and by that I mean material of the kind described in the Cluett patent 1,861,423, when after being sold and worn it is washed or laundered for the first time? A. Well, in the first washing there will be a stretching in the warp dimensions and a slight contraction in the web dimensions, and then after subsequent washings why there will be contractions of both dimensions, and the garment will shrink from the size it was delivered to the customer anywhere from one to two and sometimes up to three percent because
101 of the extra stretches that were put into the
cloth, which originally was stated the right way through the manufacturing processes in making up the garment.

Q. 135. That is due to the fact as I understand it that even if the crinkling which was put into the yarns in the Sanforizing process corresponded exactly with the shrinkage, the "spontaneous shrinkage" as Cluett describes it, which would ultimately occur, there is inevitable stretching which occurs in the process of manufacture, is that right? A. That is correct.

Q. 136. And as a result of that stretching in the sewing and other manufacturing operations there would be this shrinkage that you speak of? A. That is my understanding.

Q. 137. Now, what about the thread that is used in manufacturing a shirt of Sanforized material? Does that shrink, or does it not shrink? A. Well, of course, all thread is cotton, just like the garment, and like any other piece of cotton goods, and the cotton thread has the same properties that cotton cloth has, and there is not at the present time and there never has been to my knowledge any such thing as shrunk thread, and consequently if you sew a shrunk piece of goods with unshrunk thread, the thread will

shrink when it hits the water, and consequently there will
be a pulling in or a shrinkage or a contraction of the
102 thread, which will make a puckering in the cloth if
the thread happens to shrink more than the cloth.

Q. 138. Well, does that occur? A. It does.

Q. 139. Did the dimensions of your Relyonsize shirts made in accordance with your patent application change their dimensions either by enlargement or by contraction after they were sold and as a result either of wear or of laundering? A. Did you use the word "sold" or sewed"?

Q. 140. I may have misspoken. What I meant to ask was this: Do the dimensions of your Relyonsize shirts made in accordance with your patent application change their dimensions after being sold and either by enlarging or by contracting and as a result of wear or laundering? A. They do not change in dimensions.

Q. 141. Have any other shirts ever been manufactured and sold of which that is true in so far as you are aware? A. Never. I have never heard of such a shirt. No such shirt has ever been advertised that I have ever heard of, in the United States.

Q. 142. If it had been done, would you in your opinion know of it, for the reasons that you have stated? A. If it was any quantity of garments I certainly would have heard of it, and even though it was a small amount of garments,
the chances are I would hear of it.

103 Q. 143. How does the selling price of your Relyonsize
shirts made in accordance with the method described in your patent application compare with the price of otherwise similar shirts made by you and which have not been made in accordance with this process? A. We get approximately 75 cents a dozen more for our Relyonsize shirts than our non-treated shirts.

Mr. Williams: That is all from Mr. Mayer.

Cross Examination

By Mr. Cochran:

X-Q. 144. Mr. Mayer, does the Ainslie patent disclose the idea of making a garment oversize to allow for shrinkage which may occur later? A. It does.

Mr. Williams: No objection to my handing this (paper) to the witness?

Mr. Cochran: No, not at all.

By Mr. Cochran:

X-Q. 145. In the Watson publication, page 212, where the statement is made that—

"Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed, and measured again to determine the percentage of shrinkage."

Is there anything in that statement which limits
104 the measurement to one direction? A. Well, it is
more than that, if you would permit me to answer
the question without saying Yes or No.

X-Q. 146. Yes. A. I think the very statement that they say "washed" means that you cannot get a dimension that is accurate on the direction, because just by washing a piece goods you have got a haphazard process that won't give you actual shrinkage dimension in either direction.

X-Q. 147. But the purpose of washing it and pressing it and measuring it again was to determine the shrinkage, was it not? A. That was the purpose, yes.

X-Q. 148. And is there anything there which limits that to shrinkage in one direction or measurement in one direction? A. I would say No.

X-Q. 149. Now, will you consider the Cluett patent No. 1,861,423. Does that patent disclose the idea of determining the ultimate laundry shrinkage of a piece of cotton goods and measuring that shrinkage in both directions, warp and weft? A. If you would change the question—the reason—I think I am going to answer what you want, about whether the patent discloses it—the reading matter discloses a method of taking an ultimate laundry shrinkage and laundering it five or six or seven times and then measuring it in both directions, which will show an ultimate shrinkage. Is that the answer that—

105 X-Q. 150. In both the warp and weft directions? A. Yes, yes, after a number of launderings.

X-Q. 151. Yes. A. I think they mention even as many as six or seven, I am not sure.

X-Q. 152. And that was for the purpose of having the goods shrink as far as it ever would in service? A. That is correct.

X-Q. 153. And does the Cluett patent make use of the percentages of shrinkage in the two directions to control the process or method of practice in that patent? A. Well, in my—

X-Q. 154. In other words, does he make use of those two different shrinkages in the two directions? A. He makes some—yes, he does.

X-Q. 155. He takes that into account in his method? A. Yes.

Mr. Cochran: That is all.

Mr. Williams: Nothing more, Mr. Mayer.

(Witness excused.)

Mr. Williams: I would like Mr. Bard to take the stand.

The Court: Now, will this testimony simply be a duplication or repetition of the former testimony?

Mr. Williams: I hope not in the slightest degree.

---

106 **Albert T. Bard**, a witness produced on behalf of the plaintiff, having been first duly sworn, was examined, and testified as follows:

Direct Examination

By Mr. Williams:

Q. 1. Will you state your full name. A. Albert T. Bard.

Q. 2. And your age. A. 51.

Q. 3. And where do you reside? A. Chicago.

Q. 4. And what is your occupation? A. Vice president of the Reliance Manufacturing Co., in charge of manufacturing.

Q. 5. You are familiar with the manufacturing processes of your company? A. Yes, sir.

Q. 6. You direct them? A. Yes, sir.

Q. 7. How long have you been engaged in garment manufacturing, particularly in shirt or work-shirt manufacture? A. About 39 years.

Mr. Williams: We have here some patterns. May we get them?

The Court: Why offer those patterns?

107 Mr. Williams: Why?

The Court: They have already been described. Why introduce them in evidence? I think it is a wasting of time.

Mr. Williams: Well, of course, in Your Honor's view of the matter it must be.

The Court: Well, I think it is wasting time.

Mr. Williams: I should like to.

The Court: You do not claim a patent on those particular patterns?

Mr. Williams: One of the steps of the process that we claim of course is the measuring and then the making of patterns and the cutting in accordance with those.

The Court: Doesn't that appear on the face of it?

Mr. Williams: Yes, I think it does.

The Court: Well, I do not see any need of introducing them.

Mr. Williams: I will concede to Your Honor's viewpoint. I think there is justification for it.

By Mr. Williams:

Q. 8. I would like to call your attention to some devices, and I will ask you to state if you will what they are, and I will hand you one, first. A. This is a tubular folder for use in setting on center pieces on a work shirt.

By the Court:

108 Q. 9. What is that? A. Putting on center pieces on a work shirt, which means the button-hole side of the garment.

The Court: You are not seeking any patent on that?

Mr. Williams: That is true.

The Court: I am not going into this question as to matters which do not concern the alleged or proposed invention.

Mr. Williams: The only point, of course, in connection with these devices is to make clear why it is that in the processes of shirtmaking as applied for example or perhaps more particularly in the case of this Sanforized material which is made in accordance with the method of the Cluett patent which has been cited is to show that there is in the sewing and feeding operations a stretching out of the crinkles so that though—

The Court: You mean in the Cluett patent?

Mr. Williams: I beg pardon?

The Court: You mean in the Sanforizing process?

Mr. Williams: Yes.

The Court: Very well, then, I will permit this.

By Mr. Williams:

Q. 10. Won't you indicate or demonstrate if you can and explain as you do it how this device operates. Has that got a name in the trade, that device? A. They call it the ordinary folder.

Q. 11. A "folder?" A. A center-piece folder.
109 This is attached to the sewing machine in that manner. The operator takes this, here, this is set in front of the needle.

Q. 12. You have got a piece of cloth there that you are putting into the folder. A. That serves as the button-hole side of the garment. That is the wide strip that appears on most any work shirt. As the operator inserts that into the folder on what we call "regular" goods she is not handicapped in getting it in there, because the goods is more or less firm and is easily inserted. On the so-called Sanforized goods it is sleazy and gives and takes a good deal, so that it handicaps the operator in doing her job. In other words, it takes her longer to do the job as compared with the regular goods.

Q. 13. Now, how about the stretching of your goods in addition to that? A. The operator must hold that straight as it goes through the folder, and in doing so she gets a certain amount of stretch on Sanforized goods as compared with regular goods.

By the Court:

Q. 14. Is it similar to using a hemmer on a sewing machine? A. That is right.

By Mr. Williams:

Q. 15. Could you slide that material, the goods, the cloth, through that folder, just to indicate how it operates on a sewing machine?

110 The Court: I have used hemmers on a sewing machine, and I understand pretty well how it operates.

A. In other words, this is a large hemmer. The principle is the same as a large hemmer of a shirt, the tail of the shirt.

By Mr. Williams:

Q. 16. Now, is the stretching which occurs inevitable in feeding the goods into that folder of the sewing machine, which takes the crinkles in some measure out of the Sanforized material and puts stretch into the goods? A. It does.

Q. 17. So the shirts come out larger than would be represented by the Sanforized material itself before it is put into the work? A. Yes, sir.

Mr. Williams: We offer in evidence that folder and ask that it be marked Plaintiff's exhibit 9.

(The folder referred to was marked as Plaintiff's Exhibit No. 9 and was received in evidence.)

By Mr. Williams:

Q. 18. And these others are other folders, are they, for other operations? A. This is known—this is used for the same purpose for what we call "sleeving" and "side-seaming" operations; that is, the setting of the sleeve and the side-seaming operations.

111 Q. 19. And it performs a folding operation? A. It performs a double—what I call or what is known in the trade as a "doublefeld" operation.

Q. 20. And does that entail the same difficulties in feeding Sanforized material as apply in the case of the folder for the center plait? A. It does.

Q. 21. And does it introduce stretching in the same way and for the same reasons? A. Yes, sir.

Mr. Williams: We offer that, and ask that it be marked Plaintiff's Exhibit 10.

(The folder referred to was marked as Plaintiff's Exhibit No. 10 and was received in evidence.)

By Mr. Williams:

Q. 22. And will you look at this other one and state what it is. A. This is a yoke pressure foot with a scroll-foot attachment and turns the edge of the yoke before it goes into the 3-needle sewing operation.

Q. 23. Do the same relative difficulties apply in the case of this particular folder, and is stretch introduced for the same reason, where Sanforized material is used? A. It does.

Mr. Williams: We offer it and ask that it be marked Plaintiff's Exhibit No. 11.

112 (The device referred to was marked as Plaintiff's Exhibit No. 11 and was received in evidence.)

Mr. Williams: That is all from Mr. Bard.
Mr. Cochran: No questions.

(Witness excused.)

The Court: That is all?
Mr. Williams: Plaintiff rests.

(Thereupon the defendant, to maintain the issues on his part to be maintained, offered the following evidence:)

Defendant's Evidence

Mr. Cochran: I offer in evidence this folder on behalf of the defendant, including—

A—Copy of the Ainslie patent, No. 1,480,541
A′—Copy of Cluett patent No. 1,861,423
B—The publication entitled "Textiles and Clothing", by Watson, page 212.
C—The print of the drawings of plaintiff's application
D—The examiner's statement made on the appeal
E—The decision of the Board of Appeals, and
F—The decision of the Board of Appeals on the petition for rehearing.

(The folder referred to was marked as Defendant's Exhibit A and was received in evidence.)

Defendant rests.

* * * * * * * * * *

Patented Jan. 15, 1924. **1,480,541**

UNITED STATES PATENT OFFICE.

THOMAS DOW AINSLIE, OF METUCHEN, NEW JERSEY, AND RICHARD MARION LEVY, OF BROOKLYN, NEW YORK, ASSIGNORS TO THE ROESSLER & HASSLACHER CHEMICAL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MANUFACTURE OF ARTICLES FROM WOVEN GOODS.

No Drawing. Application filed July 19, 1923. Serial No. 652,655.

To all whom it may concern:

Be it known that we, Thomas Dow Ainslie and Richard Marion Levy, citizens of the United States, and residents of Metuchen and Brooklyn, in the counties of Middlesex and Kings and States of New Jersey and New York, respectively, have invented certain new and useful Improvements in the Manufacture of Articles from Woven Goods, of which the following is a specification.

This invention relates to improved process for the manufacture of sewed articles from woven goods, and has particular reference to the manufacture of multi-ply or seamed articles such as collars, cuffs, shirts, shirt bosoms, handkerchiefs, neck bands, underwear, aprons, dresses, coats, trousers, vests, etc., from cotton, wool, linen, silk and other or mixed fibres.

The object of the invention is to effect a substantial saving in cost of manufacture under present methods, by the elimination of unnecessary handling operations, equipment, space, heat, and general overhead expense.

The invention is particularly applicable to large scale manufacture of soft, semi-soft, and stiff white collars, and as an example, without intending to limit ourselves thereby, we will describe the application of the invention to large scale quantity manufacture of collars.

Prior to our invention the first step in the manufacture of white collars has been to bleach, usually by chlorin, the gray or unbleached piece goods as it comes from the loom, the term "gray" being applied in the cotton piece goods trade to various colors ranging from yellow to dirty white or gray according to the variety of cotton employed. The bleaching of such piece goods with chlorin requires a large space containing kiers, wash boxes, sour boxes, and bleaching machines, as well as drying cans, and tenter frames to bring the web properly to the desired width. It also requires calenders and other finishing equipment. A large amount of heat and space are required for this boiling out, washing, souring, tentering, drying and calendering, drying and finishing equipment, as well as considerable labor in handling. The dried piece goods then goes to the cutting room where it is dried out into the blanks of the finish size, and the blanks are then assembled into the rough collar through the various operations of infolding, sewing, buttonholing, etc. The rough collar may by this time have acquired considerable dirt and grease from the various machines and operations through which it has passed since the bleaching, and requires a second bleaching and washing before the final laundering.

According to our invention, we cut oversize blanks from the unshrunk gray piece goods, assemble same into the rough unbleached unshrunk and unlaundered collar, then bleach same, wash and launder for use. By this method, we eliminate the objectionable bleaching room and equipment for handling piece goods, at least one drying and one washing operation, and so materially simplify the manufacturing operations as to effect a saving of upwards of two cents per pound of finished goods.

We have discovered that the success of the process is largely dependent upon the method of bleaching used because of the difficulty of reaching the inner plies without damaging the outside. If the bleaching is not complete, the inner gray along seams creeps through in use and discolors the outside seams. We have obtained especially satisfactory results with a hydrogen peroxid bleaching method, to be more fully described hereinafter, although within the broad scope of our invention we do not restrict ourselves to any particular kind of bleach other than one capable of complete penetration and effect without damaging the outside. A hydrogen peroxid bleaching process is suitable because of the release of nascent oxygen within the plies tending to produce a balloon effect and facilitating complete penetration.

It has heretofore been considered by those skilled in the large scale manufacture of collars that the usual bleaches for piece goods either would not penetrate the several plies of the seams in a collar, or else would, before penetrating the inner plies, have weakened the outer plies, thereby damaging the fabric and shortening its life. It has also been considered that it was impracticable to shrink a rough oversized collar to the desired standard size, and have it keep to size and shape after repeated laundering, but in carrying out our invention on large scale production, we have overcome these objections with the resulting substantial saving above stated.

The piece goods as it comes from the loom may be singed if desired, after which it is removed to the cutting room where the blanks are cut to larger size allowing for shrinkage. For a 15 collar, the blanks will be cut between 15½ and 15¾ size, preferably about 15¾, as it is preferable to have a finished collar slightly oversize than slightly undersize. Other sizes will be cut in proportion, including both the outside and the interlining where an interlining is used. This invention is applicable to soft and stiff collars made of separate neck band and outside sewed together, and also to semi-soft collars which have recently come into the market made of one piece of special fabric and not intended to be starched. The blanks are preferably sewed together and buttonholed with bleached thread, and the rough unshrunk or oversize collar is then taken to the bleaching room and without any further treatment is immersed in the bleach liquor. If desired, cotton goods may be boiled out in an alkaline bath before bleaching, but the bleaching is preferably done without boiling out or other prior treatment.

A suitable and preferably mildly alkaline bleach bath is 93% sodium peroxid from 2.5 to 6.0 lbs. per 100 lbs. of goods; or from 4 to 12 lbs. sodium peroxid per one hundred gallons of water. Approximately 1.3 lbs. of 66° Bé. sulphuric acid is used for each pound of sodium peroxid in order to partially neutralize the caustic soda resulting from the reaction of sodium peroxid with water. As a retarding agent as well as an alkalining agent to permit proper penetration of the bleach to the interior plies, and at the same time to allow gradual liberation of the nascent oxygen throughout the plies, about 5 lbs. of 42° Bé. sodium silicate is used for each 100 gallons of bleach liquor. The strength of the resulting hydrogen peroxid bath ranges from ⅔ volume to 2 volumes, meaning that one gallon of bleach bath will liberate from ⅔ to 2 gallons of active or nascent oxygen. The bleach is then washed out and the collar laundered and shrunk to size. A separate operation for shrinking is not necessary, as shrinking occurs in the several aforegoing operations.

The bleaching is best carried out at approximately 180° F. for 16 to 20 hours but can be from 120° to 212° according to the material. For wool, 120° is suitable, and for boiled off silk, 145°, but for silk to be degummed and bleached in one bath, temperature up to boiling may be employed.

The practical advantages of this invention are that by bleaching the made up collar, rather than the piece goods, there is a large saving in steam because of not having to dry the bleached collar before laundering. Also, the installation required for bleaching made up collars is less extensive than that required for bleaching piece goods, because mangles, kiers, drying cans, tenter frames and calenders used in the former process prior to laundering are dispensed with. Also, there is a material saving in water required for washing before drying and cutting bleached piece goods. Labor and general overhead costs are materially less because of the reduction in the number of operations, handling, drying, cleaning, etc. Also dirt acquired in the assembling and sewing is removed without special washing and a second bleaching, which latter tends to weaken the goods.

By the process herein described, all plies of hems, seams, filling, etc. are completely bleached without reversion to gray even after prolonged exposure. Collars made by this process are of the desired size when dried after bleaching and remain so. Although we preferably only dried once after bleaching and laundering, which effects shrinkage to finish size, we do not restrict ourselves to drying and shrinking in laundering, but may dry and shrink to size after bleaching without laundering. The sewing thread is preferably bleached, but either bleached or unbleached thread has no tendency to distort the assembled collar. The finished collar has a greater tendency to remain true to size and shape in subsequent use than do collars made according to present methods and is more durable because of only being bleached once. As near as we can determine, the effectiveness of the bleach penetration throughout all plies is due to the liberation of the gas within the assembled collar between the plies which causes it to swell up or balloon and thereby gives intimate contact of the active oxygen with all portions of the fabric. Other bleach baths capable of effecting the same result may be used within the broad scope of this invention.

In the appended claims the term "multiple layer," while applied to collars or other articles, includes not only those articles which have two or more layers of fabric throughout, but also those in which the finished article contains two or more substantially parallel layers of fabric in any component part such as are formed by hems, seams, or bands.

We claim:

1. The process of manufacturing an article from woven fabric which consists in forming a rough oversized multiple layer article from unbleached piece goods, then bleaching and shrinking.

2. The process of manufacturing an arti-

cle from woven fabric which consists in forming a rough oversized multiple layer article from unbleached piece goods, then bleaching and shrinking to a predetermined size.

3. The process of manufacturing an article from woven fabric which consists in forming a rough oversized multiple layer article from unbleached piece goods, bleaching in a bleach bath capable of releasing bleaching gas throughout the layers, and shrinking.

4. The process of manufacturing an article from woven fabric which consists in forming a rough oversized multiple layer article from unbleached piece goods, bleaching in a bleach bath capable of releasing nascent oxygen throughout the layers, and shrinking to the predetermined size.

5. The process of manufacturing an article from woven fabric which consists in forming a rough oversized multiple layer article from unbleached piece goods, bleaching in a peroxid bleach, and shrinking to the predetermined size.

6. The process of manufacturing a collar or the like from woven fabric which consists in forming a rough oversized multiple layer collar from unbleached piece goods, then bleaching and shrinking.

7. The process of manufacturing a collar or the like from woven fabric which consists in forming a rough oversized multiple layer collar from unbleached piece goods, then bleaching and shrinking to the predetermined size.

8. The process of manufacturing a collar or the like from woven fabric which consists in forming a rough oversized multiple layer collar from unbleached piece goods, bleaching in a bleach bath capable of releasing bleaching gas throughout the layers, and shrinking.

9. The process of manufacturing a collar or the like from woven fabric which consists in forming a rough oversized multiple layer collar from unbleached piece goods, bleaching in a bleach bath capable of releasing nascent oxygen throughout the plies, and shrinking to the predetermined size.

10. The process of manufacturing a collar or the like from woven frbric which consists in forming a rough oversized multiple layer collar from unbleached piece goods, bleaching in a peroxid bleach at a temperature of upwards of 160° F., and shrinking to the predetermined size.

11. The process of manufacturing a collar or the like from woven fabric which consists in forming a rough oversized multiple layer collar from unbleached piece goods, sewing together with bleached thread, bleaching and shrinking to the predetermined size.

12. The process of manufacturing a collar or the like from woven fabric which consists in forming a rough oversized multiple layer article from unbleached piece goods, assembling and sewing same together, bleaching the assembled rough oversize collar throughout all layers and seams in an alkaline bath containing a retarding agent and a source of nascent oxygen at a temperature of approximately 180° F. without damaging the outer layers, and shrinking to the predetermined size.

Signed at Perth Amboy, in the county of Middlesex and State of New Jersey, this sixteenth day of July, A. D. 1923.

THOMAS DOW AINSLIE.
RICHARD MARION LEVY.

vidual, gives exactly the same effect as the flesh and blood person. The face of the individual also needs to be considered in the effect, and is of course lacking on the form.

Study of this sort will make you familiar with the lines and forms of patterns and aid you in learning to design, as well as preparing the pattern for use.

PREPARATION OF MATERIAL

Before starting to cut material be sure that it is in good condition. There should be no bad wrinkles, the selvedges (outer edges) of the goods should be laid straight and, if necessary, should be pinner together.

Shrinking of material before making is desirable in wash goods which will be laundered soon. Wash materials which will be worn a good many times before washing should not be shrunk, as wetting removes or disturbs the finish, and they will then muss or soil more easily. Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed and measured again to determine the percentage of shrinkage.

Woolen or worsted goods may be shrunk by sponging, either in the store or in the household. A good way to shrink such material is to wring a sheet out of water, then lay the sheet flat, stretch the material on top of it and roll the two together, let them stand over night, then laying the wool material on the ironing board, cover with two or three layers of newspaper and press.

PLACING THE PATTERN

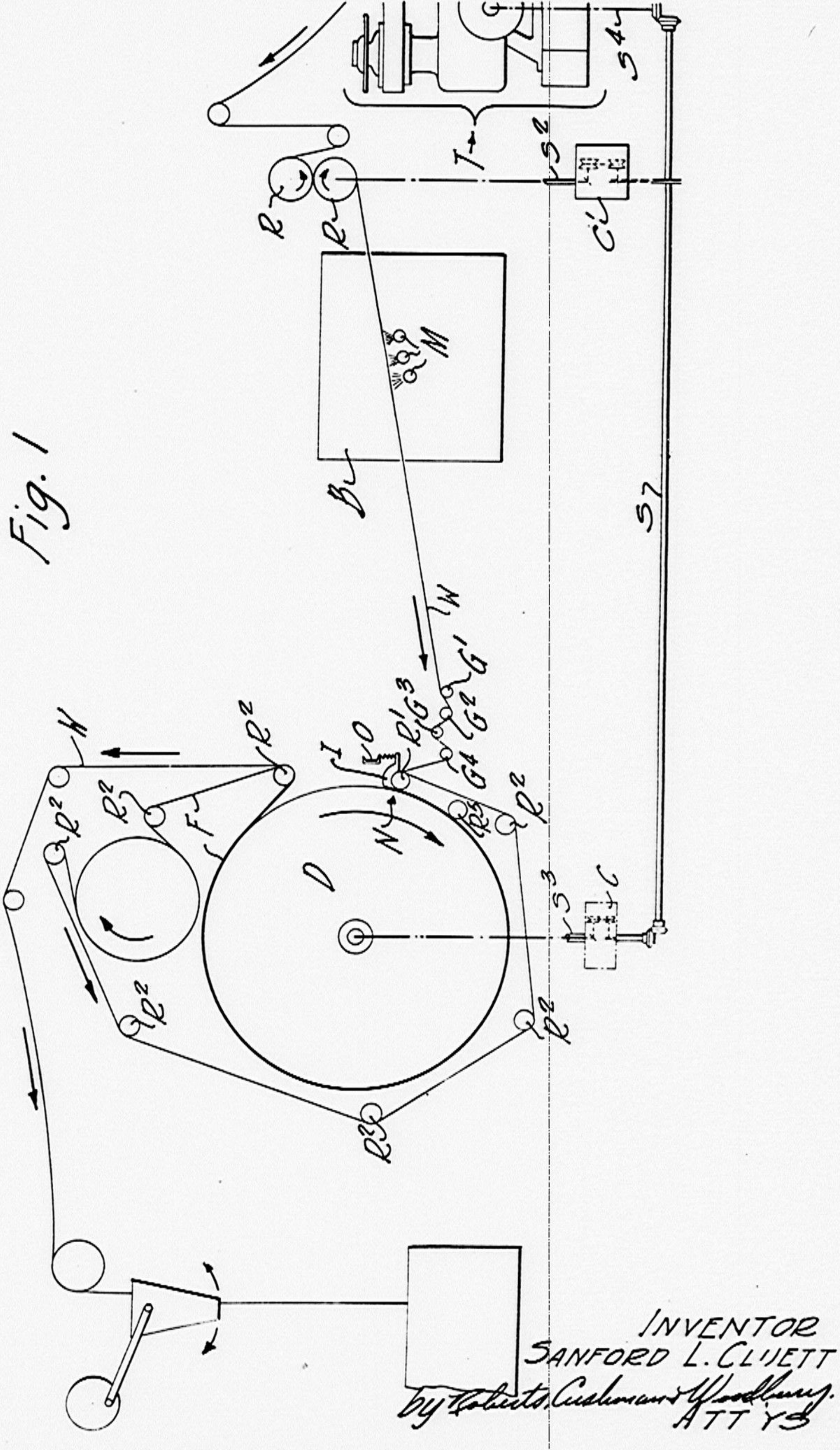
Material should be folded according to the pattern guide. Wide material is usually folded lengthwise, narrow may be folded end to end, except for the pieces to be cut on the

May 31, 1932. S. L. CLUETT **1,861,423**

CLOTH FINISHING

Filed Feb. 19, 1931 2 Sheets-Sheet 1

Fig. 1



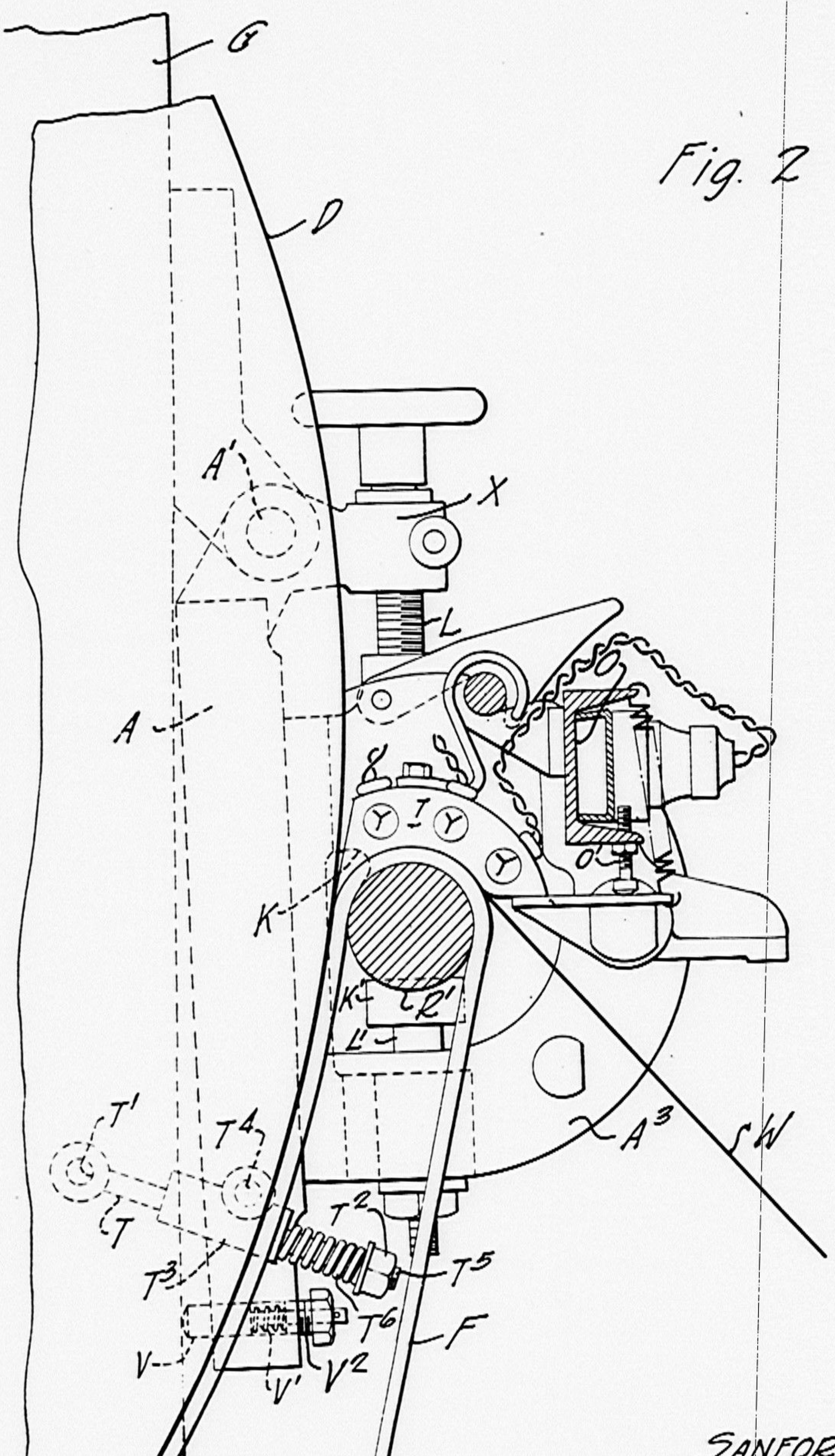
INVENTOR
SANFORD L. CLUETT
by Roberts, Cushman & Woodbury
ATTYS

May 31, 1932. S. L. CLUETT **1,861,423**

CLOTH FINISHING

Filed Feb. 19, 1931 2 Sheets-Sheet 2

Fig. 2



INVENTOR
SANFORD L. CLUETT
by Roberts, Cushman & Woodbury
ATT'YS

Patented May 31, 1932 1,861,423

UNITED STATES PATENT OFFICE

SANFORD L. CLUETT, OF TROY, NEW YORK

CLOTH-FINISHING

Application filed February 19, 1931. Serial No. 516,972.

In an application for United States Letters Patent, filed by me on April 18, 1930, Serial No. 445,300, I describe and claim a method of effecting preshrinkage in textile fabrics which, briefly stated, comprises affixing by pressure a textile web in a moistened and therefore plastic condition, at all parts of its surface to a contractible support, then causing the support to contract while the web is held fixed to it, so that the web also contracts in area, and then, as by heat and drying, setting the web in its thus altered state. The superficial contraction of the web is produced by pressure exerted in directions parallel to its surfaces; since by reason of the confinement of the web by the pressure maintained on its entire surface it can not wrinkle as a web or sheet in response to the contractile force exerted on it, the response to that force is by the component yarn systems within the web (one or both) of which the web is composed, which assume a more pronounced undulation or crinkle, contracting the web without wrinkling its surface. This may, for the sake of brevity, be termed shrinkage by compression.

Practically, this mode of shrinkage by compression is limited to shrinkage in one of the yarn systems; practically again, in the warp system, since economically continuous operation must be lengthwise of the woven pieces. Apparatus by which shrinkage by compression is effected is exemplified by one endless band of such thickness and structure that on being flexed during its movement successively in one direction and then in the reverse, that side of the band which is first convex and then concave lengthens and then shortens, so that a moist web of cloth laid upon and attached by pressure to, this convex sector partakes of the contraction of the band surface when the latter passes into the concave sector, when also the confining pressure continues to be exerted on the web. In its passage through the concave sector, the web responds to the contractile force by the crinkling of the warp yarns.

One object of this invention is to effect a predetermined and measured percentage of web shrinkage by the compression method, in any degree or quantity per yard of fabric within the shrinkage capacity of this machine operating according to said method; another object is to produce preshrinkage in both yarn systems of a web, under control of the process, so as to obtain in the finished material primarily the desired preshrinkage.

I have invented a machine for effecting shrinkage by compression, which, while it exemplifies the principles of operation described in my said application, Serial No. 445,300, is not therein specifically shown. This machine is the subject matter of an application for United States patent, copending herewith, serially numbered 516,973, filed Feb. 19, 1931, and the inventions and improvements comprised therein are reserved for claim in that application.

In the drawings:

Fig. 1 diagrammatically shows a machine of the specific type shown in application, Serial No. 516,973 in association with other apparatus; the combination being illustrative of the invention hereinbelow described; and

Fig. 2 is a central vertical sectional view of a part of the apparatus of Fig 1, to a larger scale, illustrating particularly the course of travel of the cloth just preceding and during the step of compressive shrinking.

Referring now to Fig. 1 of the drawings, the machine for effecting shrinkage by compression comprises a drum D, which is provided with means for internal heating (not shown), an endless band, F, as of felt, which is carried into contact with the drum D over a roll R′, then around the major portion of the drum to and over a series of rolls R^2, R^2. Means for maintaining proper tension on the band F, is employed, but not shown in the drawings. The relationship of the intake roll R′ with the band F and drum D is significant with regard to the effectuation of compression-shrinkage of the web of fabric W which is continuously fed in the direction indicated by arrows.

The band F is of considerable thickness, preferably of the order of one-quarter of an inch, and its structure is such (as in the case of a felt or blanket) that it is internally mobile, so that when flexed as in passing over the roll R′, its convex surface is elongated, and its concave surface shortened, the neutral zone where neither elongation nor shortening takes place, lying somewhere between the two surfaces, in the body of the band. The roll R′ is mounted on pivoted or otherwise movable frames such as A, so that the pull of the band F (the drum D being the driving member) will draw the roll R′ toward the drum D, producing a decided nip, at about the point marked N, upon the band F where, in passing from R′ to D, its flexure is reversed.

Preferably as shown in Fig. 2, each pivoted frame A, which supports an end of the roll R′ is pivotally mounted at A′ to a stationary upright G, the pivot point A′ being in the present instance above the axis of roll R′ and offset therefrom toward the axis of the drum D. To provide for vertical adjustment of the roll R′, journals at each end of the roll are preferably embraced by opposed cupped bearing blocks K and K′ which are vertically adjustable by means of upper and lower adjusting screws L and L′, each turning in bosses in the pivoted frame A.

Means is preferably provided for adjusting the position of the roll R′ with respect to the drum D, thus to regulate the degree of compressive nipping of the band and web between the roll R′ and drum D; a preferred form of such means may include a pin V carried by the pivoted roll-carrying frame A and pressed by a spring V′ against the upright G, thus limiting and cushioning the pivotal movement of the frame A and roll R′ toward the drum D. A sleeve V^2 threaded into frame A and abutting the end of spring V′ provides for adjusting the extent to which the frame A may move toward the axis of roll D. For adjustably limiting outward movement of the frame A and roll R′ away from the drum D, a sleeve T^3 pivotally secured at T^4 to the frame A, may take against a spring T^6 adjustably confined by a nut T^2 on a bolt T^5 which is pivoted to the upright G at T′.

In entering the compression-shrinkage-machine, the web W first makes contact with the band F at a line transverse thereof upon the convex, elongated surface of the band. In order to produce close and uniform attachment of the web W to the convex and elongated sector on the roll R′, I provide a series of steel ironing blocks, of which one is shown at I, in the drawings, which, curved on their under sides to fit the band F, press the web W against the band. Referring particularly to Fig. 2, each ironing block I is so shaped as to maintain a firm pressure against the cloth from about the point at which the cloth contacts with the band up to very close to the point N where the band F and cloth are nipped between the roll R′ and drum D. The various blocks I which extend across the entire width of the web of cloth, rest independently on the cloth, thus insuring that all parts of the width of cloth are firmly attached to the band F, regardless of slight flexure of the roll R′. Referring to Fig. 2, a channel iron O supported at each end by one of the frames A, carries coil springs V which pull upward on the end of lips I′ which are integral with the respective ironing blocks I. An adjustable bolt O′, threaded in the lower flange of the channel O presses against this same lip I′ and serves as a fulcrum about which the lip I′ and block I are urged by the spring V; this serves yieldingly to urge the block I into contact with the cloth on band F.

Within each of the ironing blocks I are preferably provided a plurality of electric resistance units Y which may be of conventional form and which serve to maintain the blocks at a temperature at which their under surfaces are slippery to the moist cloth. The heat from the blocks I is not applied to the cloth for a sufficient length of time to dry the cloth, but is effective in furthering the attachment of the cloth to the band F.

The web W is in a moist condition when it enters between the band F and blocks I, so that its component yarns are soft and their fibre structure capable of internal movement. As the band F passes the point N, the web is transferred from pressure-confinement against the band F by the blocks I to similar confinement between the band and the surface of the drum D, with no appreciable, or more than an instant's, release from pressure against the band, so that the reversal of curvature of the band, and the consequent shortening of its web-carrying surface, is accompanied by a corresponding shortening of the moist web, of which the yarn components (warp in this case) produces take up or shrinkage by undulation or crinkle. The shrinkage produced in the web is then set by the heating and drying on the hot drum D, and the web drawn from the band to be rolled or web folded.

If a given length of the convex surface of the band F, upon the roll R′ be represented by L, and this, upon passing to the drum D contracts to a length L′, the linear contraction is expressible by $L-L'$, and the percentage of shrinkage by

$$\frac{L-L'}{L}.$$

This represents the maximum compression-shrinkage producible in a web by the means above described.

In the practice of the invention herein described, I can produce enhanced crinkle of weft yarns, and consequent pre-shrinkage of the fabric in its width, by controlled and predetermined straightening of warp yarns, while the fabric is left free to take up widthwise, and thereafter produce a controlled and predetermined take up warpwise, by the compression shrinkage process, hereinabove described. In both these stages of the conditioning process, the compression shrinkage machine functions, in combination and relationship with the other factors of apparatus, thus:

The travel of the web W is controlled by two input rolls R, R, geared together and frictionally engaging the web. Fibre-covered or rubber-covered steel rolls will serve this purpose. The drum D of the compression-shrinkage machine is positively driven by connections S^3 from variable speed gearing C driven by a shaft S, the rolls R, R, are positively driven by connections S^2 from variable speed gearing C′ driven from shaft S. The variable speed gearing C and C′ may be set to produce any differential (within practical limits) of rate of travel of the surface of drum D and the surfaces of rolls R, R. Between the input rolls R, R and the compression-shrinkage machine there are arranged moistening devices M, M which direct water spray or water and steam, upon the web W. A box or chamber B may be employed if desired to enclose the moistening vapors. Emerging from the moistening apparatus, the web W passes through a system of scrimp bars G^1. G^2 and G^3 and under a roll G^4 of which the effect is to smooth the web so that it will not be wrinkled when it makes contact with the band F.

Let us suppose, for example, that the fabric, W, as it is delivered to the input controlling rolls R, R, has its warp yarns undulated or crinkled to exactly the degree desired in the finally conditioned goods. The gearing C will then be set so that the surface velocities of the rolls R, R and drum D are equal. The length of fabric W, extending at any given instant between the nip of the rolls R, R and the hold between the band F and pressure blocks I, will be firmly and positively held at both ends. The effect of the moisture applied at M. M is to cause the component yarns of the fabric to swell; the warp yarns are anchored at both ends of the space between rolls R. R and R′ and respond to the moistening by becoming less crinkled; they straighten, and by straightening compel the weft yarns to assume an enhanced crinkle and to take up the fabric weftwise, since in this direction there is no restraint. When therefore the fabric arrives at the roll R′ and the band F thereon, the warp yarns have straightened and the weft yarns crinkled, both as compared with their condition when passing between the rolls R, R.

The tensioned web is then affixed to the band F by the ironing blocks I, and preferably without any substantial intervening period of relaxation of the warp tension is subjected to the warpwise compressive shrinkage step hereinabove described. Since the surface velocity of the drum D is (in the case supposed) equal to that of the rolls R, R, the length of cloth W passing a given fixed point, such as the nip point N, in a given time, must be equal to that which passes the nip of the rolls R, R, and, provided the compression-shrinkage capacity of the system represented by the band F, roll R′ and drum D be adequate thereto, the warp yarns of the fabric W are compelled to reassume precisely the same crinkle that they had in the fabric as it passed through the rolls R, R.

Two variable factors affect the weftwise take up, or preshrinkage, effected in a system such as above described, namely, quantity of moisture applied to and absorbed by, the fibrous yarns, which compose the fabric, and the time allowed for absorbed moisture to produce its effect on the individual yarns. The means for applying moisture to the fabric may be made adjustable, as by provision of a series of spraying pipes, M. M. part or all of which may be used, according to the requirements of the operators.

The time allowed for applied moisture to produce its effect depends on the velocity of travel of the web W and the distance between the input rate controlling means (R, R) and the output rate controlling means (D, F. R′). Therefore, in designing and proportioning apparatus of the character described, it will be well after determining the practical maximum velocity of fabric movement to provide sufficient distance between input controls and output controls, to afford time for the least bibulous fabric to absorb a maximum of moisture, to provide also adequate moistening means to supply the predictable maximum of moisture absorption by a moving fabric. The size and the practical maximum of temperature of the drum D will be determined with regard to the cloth drying requirements, and should be designed with a view to the probable extreme case of such requirements.

It is to be noted that while in a simple ironing operation it is usually desirable that the cloth be moistened at as short a distance from the ironing drum as is practicable, the practice of my process to shrink both weftwise and warpwise usually involves rendering the cloth moist and plastic at a considerable distance from the point at which it is ironed. For instance, the web cloth between input rolls R, R and output roll R′ has a considerable length and when rendered moist and plastic by the devices M is free to shrink weftwise without interference. Particularly in the event that a high degree of weft shrinkage is to be obtained, by tensioning the web W between the input and output rolls, it is desirable that a considerable length of the web be substantially unconfined in a weftwise direction, say 20 feet.

If desired, one or more of the bars G^1, G^2 or G^3, for example bars G^2 and G^3 may have their cloth contacting surfaces cut into threads which diverge from the middle of the bar and tend to spread the passing web of cloth, thus checking weftwise shrinking at a point in the progress of the web, at which sufficient weftwise shrinkage has taken place. Advantageously, the bar G^3 may be adjustable vertically to vary the extent of contact of the web and the bars and roll G^4.

Since the compression-shrinkage imposed on a fabric by apparatus of which the drum, band, and drying roll system (R′, F, D) is an example will always be represented by the formula

$$\frac{L-L'}{L},$$

hereinabove explained, it follows that the least warp crinkle of a fabric treated by the apparatus as a whole and finally delivered from the band F will appear when the adjustments of input rate, output rate, fabric moistening and tension warpwise in the space between the input rate controlling means and the output rate controlling means are such that the warp yarns of the fabric are straight and without crinkle when the fabric enters the compression-shrinkage apparatus.

Imposition of these conditions will produce maximum crinkle of the weft yarns, and therefore maximum shrinkage of the fabric weftwise. In this extreme case, the differential drive-connections C and C′ will be so adjusted to give the surface of the drum D its practical maximum excess velocity over that of the surfaces of the input controlling rolls R, R.

It follows also, that the maximum producible warp crinkle in a fabric conditioned and delivered from the band F of the compression-shrinkage factors of the apparatus will ensue from an adjustment of the surface speed differential between D and rolls R, R, which, with a given moisture absorption and time for the spontaneous response thereto by the fabric yarns, delivers the fabric to the compression-shinkage system under no appreciable tension. In this extreme, or limiting case, the weftwise preshrinkage will be that produced by the spontaneous take up and crinkle of the weft yarns. The differential drive-connections C and C′ will be set so that the surface velocity of the drum D will be less than that of the input controlling rolls R, R, by a differential which fully and exactly compensates for the spontaneous and unrestrained shrinkage and crinkle of the warp yarns produced by absorption of moisture.

Any desired balance, or ratio, between weft and warp preshrinkage between the two extremes above mentioned, can be accurately produced and uniformly maintained, by adjustment of the differential drive-connection C.

If the warpwise shrinkage capacity of the compression-shrinkage system be adequate to preshrink fabric from a straight-warp condition to one of such high degree of warp yarn crinkle that the fabric, when set by drying under heat, is incapable of further shrinkage warpwise when subjected to laundry treatment or its equivalent, the system or apparatus above described will be capable of imposing practically complete unshrinkability in a fabric, both warpwise and weftwise. If the compression-shrinkage expressed by the terms

$$\frac{L-L'}{L}$$

be less than that required to impose complete preshrinkage on a fabric of which the warp yarns are straight when the fabric enters the compression-shrinkage apparatus, and further warp-shrinkage is desired, the fabric may be remoistened after delivery from the compression-shrinkage apparatus and subjected to similar compression treatment in another similar apparatus, to which the fabric will be conducted in a relaxed condition, under no appreciable tension. Or, the fabric may be retreated in the same or similar apparatus, which will be so adjusted as to drive-differential to produce the increased warpwise shrinkage without attaining the weftwise shrinkage already imposed.

Preferably the drive shaft S is connected, as by suitable connections indicated at S^4, to the web-advancing instrumentalities of a tentering machine T. Thus the advance of the web through the stages of weft-shrinkage and warp-compression will be in timed relation to the advance of the web in the tentering operation. By adjusting both differential drive connections C and C′, both the input controlling device constituted of rolls R, R, and the warp-compressing and web-ironing device, may be caused to operate at the proper speeds to accommodate the cloth at the particular rate at which it is delivered by the tentering machine. By further adjusting differential drive connection C, the balance or ratio between weft and warp preshrinkage can be obtained. In relation to the tentering machine, the above described mechanism constitutes a valuable ironing and finishing adjunct capable of giving the web just before ironing a final lengthwise straightening under conditions of warp tension and weft relaxation (which improves the alignment and texture of the tentered goods) without producing in the finished ironed goods a corresponding amount of warp elongation.

Furthermore, conditions of warp and weft crinkle or straightness in the goods leaving the tentering machine can as described above, be modified in easily variable degrees just before the goods are ironed and without sacrificing the uniformity in web width obtained by tentering. By modifying a tentering and ironing combination of devices, to operate according to the principles of this invention, renders possible the obtaining in the same organization of devices many varied degrees of both weft and warp crinkle, and superficial area of web, all by simple adjustments of the controlling mechanism as described above.

The mechanical treatments incident to the operation of shrinkage controlling apparatus such as above described, that is to say, the pressure exerted by the input controlling rolls R, R, the friction ironing by the blocks I (which preferably are heated) and the pressure ironing by the felt F and hot drum D, the smoothing friction of the bars and rolls at G, and the sequence of moistening and swelling of the yarns and the heat drying of the fabric, all serve to improve the appearance and finish of the fabric.

Furthermore, the described sequence of operations, producing internal rearrangements of warp and weft systems in the fabric while the fabric is held under positive control, improves the fabric by squaring its mesh and correcting such distortions and departures from true yarn alignment, as may have been produced in the loom or in subsequent manipulations of the woven goods. Stripes, checks, or other figures in the goods are brought into their correct and intended contours. Thus, aside from the values of the above described process and apparatus in regard to controlled and predetermined shrinkage of fabric, the treatment imposed on fabric is incidentally or collaterally beneficial from other points of view of the cloth finisher and his customers. With this aspect of the process under consideration, a sequence of operations further extended than that hereinabove described constitutes a fuller and preferred embodiment of the invention, to wit:—

Before introducing the web of fabric into the apparatus, such as illustrated in the drawings hereto annexed, let it be subjected to the warpwise shrinking process described in my United States Patent No. 1,734,897, dated November 5, 1929, and as effected by a tentering machine in which my improvements are incorporated. The tentering machine T of Fig. 1 of the accompanying drawings is then preferably the machine described and claimed in my United States Patent No. 1,734,896, also dated November 5, 1929. In such a machine the cloth web is preshrunk warpwise, the weft yarns being tensely straightened while the warp yarns are allowed to relax and become highly crinkled. The operation of initially preshrinking the cloth warpwise in this way is of advantage in this instance in that it presents the cloth in a predeterminable and controllable condition of warp crinkle, in uniform width, and with its weft or filling yarns true and everywhere at right angles to the warp. Furthermore in many cases it is desirable to impart a greater crinkle to the yarns than could be attained solely by the compressive shrinking apparatus and the system of input and output rolls and moistening devices. In such cases the differential drive connections C will be so adjusted that some degree of crinkle (previously imparted in the tentering machine), remains in the cloth when the latter reaches the compressive shrinkage device; the warp crinkle imparted in the compressive shrinking device will be additive with respect to that imparted in the tentering machine. The cloth will, intermediate these steps acquire the desired weft crinkle between the rolls R, R, and R′.

The warpwise preshrunken fabric received by the rolls R, R from the tentering operation will already have undergone a weave-squaring process; in its passage through the apparatus herein illustrated the warp yarns will straighten to some extent, (more or less according to the adjustment of the differential drive-connections C and C′, as hereinabove explained) and the weft yarns, by spontaneous response to the moistening, and also, if desired, by tension applied to the warp yarns, will assume a crinkle which had previously been straightened in the tentering machine. Then the warp yarns will be crinkled by the operation of the compression-shrinkage apparatus. The fabric finally delivered, set in its condition of both warp and weft preshrinkage, will be as nearly perfect in such alignment as is possible, and will have taken on a body-softness and surface finish of higher and better quality than is producible by any treatment heretofore known to me.

Woolen fabrics are very diverse in their characteristics, variations almost from yard to yard are discernible in the same piece of fabric; the same warp and weft yarns, in plain weave produce a fabric which behaves quite differently under the treatment herein described, from one in basket, twill, or diagonal weave, consequently the wide range of adjustability provided by the herein described apparatus and its susceptibility also to delicate alterations in adjustment during operation and as variations in the fabric under observation demand it, adapts this apparatus to the production of practically any desired preshrinkage effect on any fabric in the large category of goods which pass through the cloth-finishers' hands.

The cloth web W treated in and by the above described apparatus and process may be and usually is one which has a trade finish, (which in cotton, linen, and similar materials, imparts a lustrous glossy appearance) resulting from such usual cloth finishing processes as calendering, dressing, braking, ironing, etc. Such trade finish is not impaired by the treatment described herein.

Certain woven fabrics, for instance twills and loosely woven printed fabrics such as percales, exhibit the property of shrinking to some extent each of a plurality of times they are laundered, the ultimate shrinkage attained after several repeated launderings being greater (in one or both dimensions) than can be forestalled by preshrinkage by usual water treatment.

I prefer, before undertaking to finish a fabric, to subject a sample of the fabric to repeated launderings such as the fabric will encounter in use, noting the shrunken size of the fabric after each laundering and to continue these successive launderings until no appreciable shrinkage is obtained by further laundering. The total shrinkage thus obtained may be called the "ultimate laundry shrinkage". Having ascertained this quantity as nearly as possible, for both dimensions of the cloth sample, I then impart this degree of preshrinkage to the cloth of which the sample was taken, preferably by the method and apparatus herein described which are competent to impart such preshrinkage, equal to or closely approximating the ultimate laundry shrinkage of a previously unshrunken sample. The wide range of adjustability of my improved apparatus enables such preshrinkage to be imparted in the right amount both to wefts and warps of the cloth. A finished preshrunken cloth of this kind may actually stretch in its first laundering, (its preshrinkage being greater than the amount of potential shrinkage of the first laundering) then in the next laundering, or in each of several succeeding launderings, the cloth will shrink until it returns to its original preshrunken dimensions. Thereafter, the cloth will neither shrink nor stretch to any substantial extent, as a result of laundering. Thus a garment made of such cloth, preshrunken accurately with relation to its predetermined ultimate laundry shrinkage in both dimensions will at no time be less than its original size, may somewhat exceed its original size in one or both dimensions upon being laundered once or a few times depending on the fiber and weave, and will, after a sufficient number of launderings, return to its original size. If accuracy of ultimate size is desired in only one dimension, such measured and predetermined preshrinkage may be practiced with relation only to that one dimension of the cloth. It is however preferable that both yarn constituents of the fabric shall have, upon completion of the preshrinkage operation, a crinkle at least approximately as great as the degree of crinkle imposed by the weaving operation, as distinguished from a marked and abnormal straightness of yarn. Thus it is assured that while one yarn constituent of the cloth grows and then shrinks to its preshrunken length, the other yarn constituent will not experience the spontaneous shrinkage of straight yarn.

A specific instance of preshrinking to accommodate ultimate laundry shrinkage may be my preferred treatment of a "uniform twill" of which the maximum laundry shrinkage may be determined by test at 2.25 inches per yard in warpwise dimension and 0.55 inches per yard in weftwise dimension after four launderings. The warpwise shrinkage may here occur in increments in successive launderings, and the maximum weftwise shrinkage may be attained in the first laundering. The cloth would be preshrunken preferably by my easily regulable process to these same extents, namely 2.25 inches per yard in warp and 0.55 inches per yard in weft. In the first laundering to which the preshrunken cloth is subjected, it will grow in warpwise dimension, thus offsetting further shrinkage in this dimension. Whether or not the cloth's weft crinkle is thus accurately adjusted to compensate for the expected shrinkage, it will in any event be found preferable, (as suggested above) to avoid abnormal straightness of wefts in the finished preshrunken cloth; my improved process is particularly advantageous in this connection in permitting a final warp crinkling step without sacrifice of weft crinkle.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. Method of treating textile webs comprising stretching one yarn component of the web, in one dimension while allowing take-up of the other yarn component and shrinkage of the web in the other dimension, then causing take-up of the previously stretched yarn component by compression exerted on the web parallel with its surface, and setting the web in its altered state.

2. Method of treating textile webs comprising stretching one yarn component of the web, in one dimension while allowing take-up of the other yarn component and shrinkage of the web in the other dimension, confining the web against a support contractible in its superficial extent, causing the support to contract while the web is confined thereagainst, and setting the web in its altered state.

3. Method of treating textile webs comprising rendering the web plastic, conveying the web in the direction of its warp components under tension, while permitting the web to take up in the dimension of its weft yarns, confining the web while yet under tension against a support alterable in its superficial extent, then diminishing the superficial extent of the support and the associated web warpwise of the web, to cause take-up of the warp components of the web, and setting the web in its diminished superficies.

4. Method of treating textile webs comprising rendering the web plastic, inducing warpwise tension in the web sufficient to cause take-up of weft components of the web and enhance their crinkle; then, without any substantial intervening period of relaxation of such warp tension, subjecting the web to compressive forces perpendicular to the web thus to retain the weft crinkle, and to compressive forces parallel to the web, thus to cause warp take-up, and setting the web in its altered state.

5. Cloth treating apparatus comprising in combination means for stretching the warp yarns of a plastic woven web to cause the weft yarns to crinkle, means for causing take-up of the warp yarns by compression exerted on the web parallel with its surface, and means for setting the web in its altered state.

6. Woven textile web non-shrinkable in both dimensions, having its original trade finish substantially unimpaired and characterized by the smoothness and absence of wrinkles which results from subjecting the web serially to substantially maximum preshrinking of the weft yarns and then of the warp yarns without substantial coincidence in time of shrinking of both systems of yarns.

7. Shrunken woven textile web, substantially non-shrinkable in both dimensions by laundering, said web having both its weft and its warp yarns crinkled substantially to a maximum extent, and having its original trade finish substantially unimpaired.

8. Preshrunk woven textile web, having its weft yarns crinkled by warp tension while the web is in a plastic state, and having a crinkle in its warp yarns subsequently applied while the web is held by pressure against wrinkling.

9. Shrunken woven web having substantially equally shrunken dimensions of both warp and weft including wefts crinkled by warp tension while the web is in a plastic state, said warps also lying in a crinkled state as the result of shrinkage warpwise of the web by warp crinkling.

10. Shrunken woven web having its original finish substantially unimpaired and having substantially equally shrunken dimensions of both warp and weft including wefts crinkled by warp tension while the web is in a plastic state, the warps of the web also lying in a crinkled state as the result of shrinkage warpwise of the web by warp crinkling, the web being set by drying to maintain these relations of warp and weft.

11. Cloth treating apparatus comprising means for moving a plastic woven web in a warpwise direction under warp tension sufficient to enhance the crinkle of the weft components of the web in combination with means for shortening the superficial extent of successive increments of the web in its warpwise dimension without disturbing the enhanced crinkle of the weft components, and means for setting the web in its altered state.

12. Cloth treating apparatus for combined weft and warp shrinkage of a plastic woven web comprising instrumentalities acting on the web to advance the web in a warpwise direction and simultaneously to apply undulations to the warp, in combination with means for maintaining in the web approaching said instrumentalities a warp tension effective to produce weft shrinkage by crinkling.

13. Cloth treating apparatus for combined weft and warp shrinkage of a plastic woven web comprising instrumentalities acting on the web to advance the web in a warpwise direction and simultaneously to apply undulations to the warp, in combination with means for maintaining in the web approaching said instrumentalities a tension effective to produce weft shrinkage by crinkling, the apparatus including a moistening device acting on the part of the web under tension.

14. Cloth treating apparatus for combined weft and warp shrinkage comprising instrumentalities acting on the web to advance the web in a warpwise direction and simultaneously to apply undulations to the warp components of the web, web-feeding means gripping the web in rear of said instrumentalities, means for maintaining a state of moisture in the web between said instrumentalities and said feeding means whereby the weft components of the web tend to shrink, and means for establishing a speed differential between said instrumentalities and said feeding means.

15. Cloth treating apparatus including means for shrinking a textile web in its warpwise dimension by compression of its warps, in combination with means for feeding the web to said shrinking means under such a degree of warp tension as to secure a preliminary straightening of the warps.

16. Cloth treating apparatus comprising means for advancing a web of cloth in a warpwise direction, means for selectively shrinking the web during its progress, first in one dimension and then in the other dimension, and means for imparting a variable warpwise tension to the portion of the cloth undergoing one of said shrinking operations so as to vary the ratio of shrinkage in one dimension with respect to the shrinkage in the other dimension.

17. Cloth treating apparatus including web-feeding and warp compressing devices acting successively upon an advancing web, the web-feeding device being adapted to tension the web approaching the warp compressing device to shrink the cloth in width, means for driving said devices, and means for varying the ratio between the speeds of said devices.

18. Cloth treating apparatus including a

contractible support, means for affixing a web to the support, means for moving the support and web and for simultaneously causing the support and web to contract warpwise of the web, means for rendering the web plastic before affixation to the support, input feeding means effective to tension the web approaching said support to shrink the cloth in width, and means for establishing a speed differential between the rate of feeding of web by said input feeding means and the rate of travel of said contractible support.

19. Cloth treating apparatus comprising means for compressively shrinking an advancing web in its warp dimension, means for maintaining tension in the web approaching said shrinking means, means for maintaining the web moist so that it can yield to said tension by straightening of its warps preliminary to warp shrinking, and means for varying the tension in said web, thereby to vary the degree of preliminary warp straightening, and accordingly the degree of ultimate warp shrinkage.

20. Cloth treating apparatus comprising means for stretching a web of cloth in the direction of its wefts, means operable thereafter to shrink the web in a weftwise dimension by stretching the web warpwise while maintaining it relaxed weftwise, thus straightening the warp yarns and enhancing the crinkle of its weft yarns, means for causing take-up of the warp yarns by compression exerted on the web parallel with its surface, and means for setting the web in its altered state.

21. Cloth treating apparatus comprising in combination a tentering machine operable on a traveling web to bring the web to a desired uniform width, means operable on the web leaving the tentering machine to shrink the web selectively in its weftwise dimension, means for causing take-up of the warp yarns of the web by compression exerted on the web parallel with its surface, and means for setting the web in its state of weft and warp shrinkage.

22. Method of treating a woven web of cloth which comprises equalizing the width of the web by stretching, then allowing the weft yarns to relax and crinkle by the action of absorbed moisture, thereafter, while the weft yarns are in a crinkled state, causing warp take-up by subjecting the web to contractile pressure exerted in directions parallel with the web surfaces, and setting the web in the thus improved condition.

23. Method of treating textile woven webs, characterized by first stretching the web weftwise while maintaining it relaxed warpwise, thus straightening the weft yarn and producing take-up warpwise by enhanced crinkle of the yarp yarns, then stretching the web warp-

thus restraightening the warp yarns and producing take-up weftwise by crinkle of the weft yarns, thereafter subjecting the web to contractile pressure exerted in directions parallel with the web surfaces and with the warp yarns, thus producing warp yarn crinkle while conserving the take-up produced by the weft yarn crinkle, and setting the web in the thus imposed condition.

24. Apparatus for treating textile woven webs, including means for stretching the web weftwise while maintaining it relaxed warpwise, means operable on the thus treated web to cause crinkle of the weft yarns with attendant straightening of the warp yarns, means operable on the web after such treatment for subjecting the web to contractile pressure exerted in directions parallel with the web surfaces and with the warp yarns, and means for setting the web in the thus imposed conditions of weft and warp shrinkage.

25. Method of treating textile woven webs, characterized by first stretching the web weftwise while maintaining it relaxed warpwise, thus straightening the weft yarns and producing take-up warpwise by enhanced crinkle of the warp yarns, then conveying the web in a warpwise direction in a moist plastic state under a minimum of warp tension while permitting the weft yarns to take up, thereafter subjecting the web to contractile pressure exerted in directions parallel with the web surfaces and with the warp yarns, thus producing warp yarn crinkle while conserving the take-up produced by the weft yarn crinkle, and setting the web in the thus imposed condition.

26. Textile fabric substantially nonshrinkable in both directions such as results from a mechanical treatment of woven fabric whose constituent yarns possess substantially the relative crinkle resulting from the weaving operation, such treatment comprising tensioning the material warpwise while maintaining it relaxed weftwise until the weft yarns assume substantially a maximum crinkle, the warp yarns becoming substantially straight, and thereafter compressively squeezing the warp yarns to substantially a maximum crinkle while the weft yarns substantially retain their previously assumed crinkle.

27. Textile fabric substantially nonshrinkable in both directions, such as results from a mechanical treatment of woven fabric whose constituent yarns possess substantially the relative crinkle resulting from the weaving operation, such treatment comprising tensioning the material weftwise while allowing it substantial freedom of movement warpwise until the warp yarns assume substantially maximum crinkle and the weft yarns become substantially straight, then tensioning the material warpwise while

weftwise until the weft yarns assume substantially maximum crinkle and the warp yarns become substantially straight, then compressively contracting the material warpwise until the warp yarns regain substantially maximum crinkle while the weft yarns retain the crinkle previously assumed.

Signed by me at Troy, N. Y., U. S. A., this 14th day of Feb., 1931.

SANFORD L. CLUETT.

Jan. 16, 1934. S. L. CLUETT **1,944,001**

APPARATUS FOR TREATING FABRICS

Original Filed April 18, 1930

Fig. 1

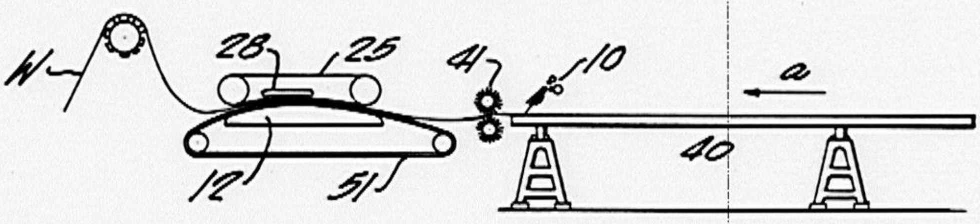


Fig. 3

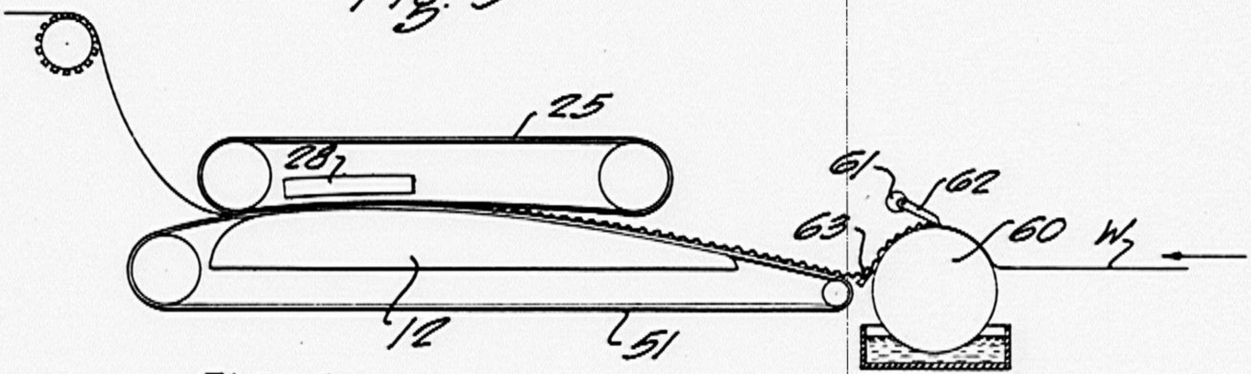


Fig. 4

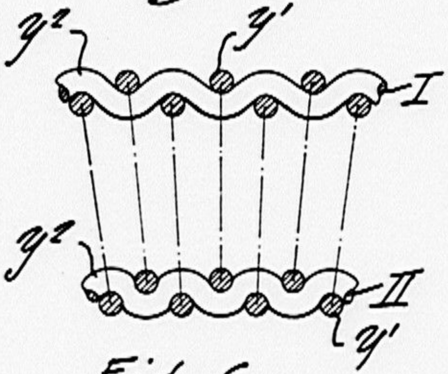


Fig. 2

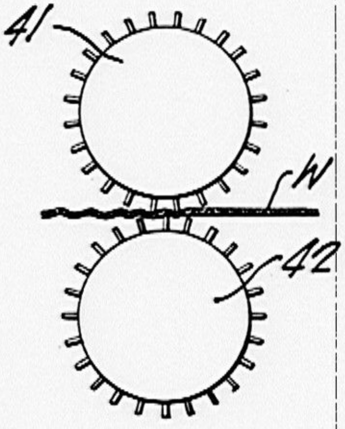


Fig. 5

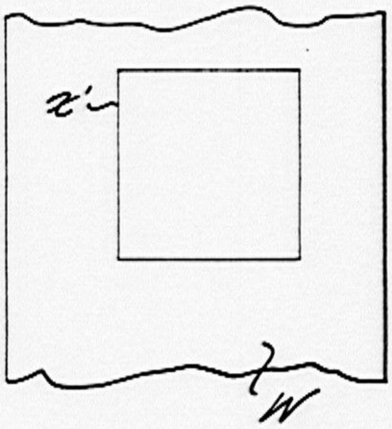


Fig. 6

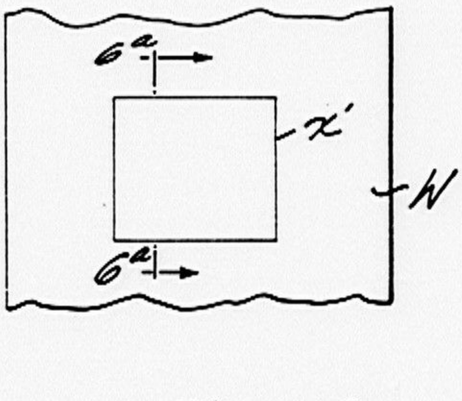


Fig. 5^a

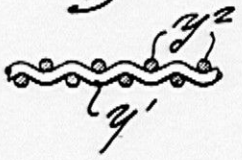
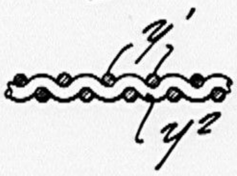


Fig. 6^a



INVENTOR
SANFORD L. CLUETT
by Roberts, Cushman & Woodberry.
ATT'YS

Patented Jan. 16, 1934 **1,944,001**

UNITED STATES PATENT OFFICE

1,944,001

APPARATUS FOR TREATING FABRICS

Sanford L. Cluett, Troy, N. Y., assignor to Cluett, Peabody & Co., Inc., Troy, N. Y., a corporation of New York

Original application April 18, 1930, Serial No. 445,300. Divided and this application April 16, 1932. Serial No. 605,649, and in Australia August 23, 1930

9 Claims. (Cl. 26—20)

This invention relates to mechanism for altering the superficial dimensions of textile fabrics and is a division of my application Serial No. 445,300, filed April 18, 1930.

One object of the present invention is to provide improved mechanism adapted to operate upon cloth, which may already be finished in the sense of having been bleached, mercerized, printed, dyed, calendered, starched, ironed or polished or any of these, in such a way as to secure and set in the cloth a maximum contraction in at least one dimension of the web. Another object of this invention is to provide mechanism adapted to complete or supplement a state of one dimensional shrinkage by causing the cloth to shrink in another dimension, and to do this without detriment to the effect, if present, gained by shrinkage in the first dimension.

In a preferred series of steps which can be carried out by the mechanism of this invention, the cloth may be subjected to a humidifying or a moistening treatment tending to soften adhesions or stiffnesses caused by starchy or gummy dressings and then be caused to collapse or lie in a shorter extent in one dimension upon a suitable carrier, and concomitantly or thereafter be fixed in its collapsed state in that dimension, preferably by heat and pressure.

The invention will now be explained in connection with the accompanying drawing which illustrates preferred mechanisms only by way of illustration of the invention.

In the drawing:

Fig. 1 is a diagrammatic side elevation of apparatus according to the present invention;

Fig. 2 is an enlarged diagram in elevation of an instrument of said apparatus;

Fig. 3 is a diagram in side elevation of modified apparatus of the present invention;

Fig. 4 is a diagrammatic section of the fabric comparing its condition in two stages of the treatment;

Figs. 5 and 6 are respectively comparative diagrams in plan of cloth not treated and cloth after it has been treated;

Fig. 5^a is a section either warpwise or weftwise of the said cloth in the state illustrated in Fig. 5; and

Fig. 6^a is a section warpwise showing the state of the cloth illustrated by Fig. 6.

The apparatus of this invention is adapted to perform the process described in my said application, Serial No. 445,300 to alter the superficial dimensions of cloth which has not been subjected to any shrinkage operation, or has been only partially shrunken or has been shrunken in one direction only. For comparison, as shown in Figs. 5 and 5^a, a typical cloth w of simple weave may present a warp or weft system of yarns y' interengaged with a cross system of yarns y^2, the relative lie, crinkle, or arrangement of the said yarns in respect to each other, whether they are longitudinally extending warps or laterally wefts, being such that the yarns are bent over members of the other series of yarns so as to extend from side to side of the superficial faces of the fabric and to be substantially evenly distributed on either side of a medial longitudinal plane of symmetry. If such a piece of cloth w should have laid off upon it at x^1 a marked square, the dimension of the marked area would be changed by shrinkage. Such a change will not be effected in any manner without causing some different relation of the yarns y^1 to the yarns y^2. This condition is true whatever the weave-construction of the fabric may be.

The effect desired is to shrink the longitudinally extending or warp system yarns y^2 by causing the collapse or take up of the yarns y^2 and recession or contraction of the distances separating wefts y' (Figs. 4 and 6^a) to or slightly beyond the degree which would be attained by repeated laundry washings of the fabric. Referring to Fig. 4 this is accomplished by so operating upon the moistened and internally mobile cloth as to take up the crinkled warp yarns illustrated by the typical warp system member y^2 at I in said figure, through a desired degree to occupy the shorter space of the said yarn as shown at II in said figure, in order to cause the cloth originally in the condition shown in Figs. 5 and 5^a to be longitudinally shrunken as illustrated in Figs. 6 and 6^a.

The mechanism of this invention is adapted to produce the desired shrinkage or dimensional contraction of the textile fabric by subjecting it, while in such plastic or internally mobile condition, and in a state of undulation, to compressive forces directed generally normal to the web, to condense or crowd together the yarn components, so as to enhance in degree the yarn undulation or crinkle originally produced by the weaving operation.

A preferred treatment of the cloth, as indicated at 10, Figs. 1 and 2, includes the direct application to the web, as shown, to its upper face, of a fine spray or mist of water, steam or other suitable saturant capable of entering the capillary spaces of the yarns. A preferred form of moistening device 10, indicated in the drawings, is a form of air-blast atomizer using water, and adapted to apply a predetermined quantity according to the speed of passage of the cloth in order to accomplish the desired moistening or capillary filling of the yarns, and not to have any permanent detrimental effect on the attained finish of the goods, so as to leave its trade finish substantially unimpaired. I have determined by experience that these quantities can be ascertained for any particular cloth, having regard to its contained moisture when delivered to the apparatus, the temperature of subsequent treatment, and especially the distance separating the moistening station at 10 from the place where the cloth is dried, for example by application of heat, to secure the degree of effect desired. Added water to the extent of from 5 to 10 per centum of the weight of the cloth is usually sufficient for collar and shirting cloths.

Referring to Figs. 1 and 2, the cloth web *w* is fed in the direction of the arrow over a table 40, and moisted by the spray device 10. It then passes through a web-crinkling device, comprising suitably driven rolls 41, 42 equipped with radial, parallel, rounded-edged vanes, set so that the edges of the vanes intermesh, as shown in detail in Fig. 2, and produce undulations in the web. The web then passes to an endless belt 51 which travels at a rate slower than that at which the web is fed or drawn into the crinkling vane-rolls 41, 42, so that the undulations or ridges formed in the web shall not be disturbed, either by extension or contraction.

The carrier belt 51 travels over the surface of a convex bed 12, which may if desired be hollow, perforated and exhausted by any suitable suction device, to facilitate removal of moisture from the belt 51 and web *w*. On the surface of bed 12, the belt 51 enters the nip between said surface and a tense, flexible, endless band 25, preferably of smooth metal, which presses the cloth against the belt 51, supported by the bed 12, the band and belt traveling at the same rate, so that the pressure exerted on the web *w* shall be transverse only, i. e.—normal to its general surface. A radiating heater 28 is provided, which, as indicated may be an electric resistance heater, or might be a steam box.

The crinkled or undulated web, in which the yarns have been softened and their contained starchy or sizing materials rendered plastic by moistening, is subjected to progressively increasing transverse (i. e. normally exerted) pressure as it passes into the gradually reducing space between the belt 51 and band 25. The crests or salient features of these undulations are depressed, this depression develops a compressive component of force, exerted at all points in parallel with the surfaces of the web, which by reason of its frictional adhesion to the carrier belt 51 can not creep on the belt to any appreciable degree. The lengthwise (e. g. warp) yarn components are by this compressive force constrained to assume a more sinuous crinkle, while the widthwise (e. g. weft) yarn components are crowded more closely together. The web as a whole is dimensionally contracted, occupying in its flattened condition the same length as in its previously undulated condition. When thus flattened and compresively condensed, sufficient moisture is eliminated, as by the heater 28 to fix the web in its shrunken state.

The longitudinal state of collapse and fixation of this state of collapse of the longitudinal element of the cloth may be secured by the modified form of apparatus of Fig. 3. Referring now to Fig. 3, the web *w* may be delivered in the direction of the arrow on to the surface of a moistening and tractor roll 60 to which the surface of said web adheres in the manner of wet cloth by the capillarity of the wetting fluid. While in this condition of moist adhesion, a rapidly reciprocating doctor knife 62 worked by an eccentric 61 of very slight eccentricity may act upon the cloth to detain it in fine crepe-like ridges which are retained during passage of the cloth over a doffing knife 63 on to the carrier belt 51, which may be caused to pass at a rate which is less than the rate of delivery to the roll 60, so as to conserve the ridge-formation, over a bed 12 and enter under a tense band 25, between which and the belt 51 the crepe-like ridges are flattened to effect a longitudinally collapsed arrangement of the web components, which arrangement is then fixed as by heat and pressure. The heat may be supplied by the heater 28 of the apparatus above described.

In both forms of apparatus herein illustrated the effect of transverse pressure is to cause the longitudinal system of yarns to assume a more crinkled form when the applied pressure reduces the fine and slight wrinkles to the common plane of the space between pressure devices. The length of these yarns taken up in the wrinkles or crepings, when these are flattened, is subjected to endwise compression as a result of flattening the blisters or wrinkles. A degree of wrinkling which would cause the cloth to lap on itself in folds on being subjected to transverse pressure is of course avoided.

I claim:

1. Apparatus for shrinking fabric webs, comprising in combination, means for moistening the web, means for forming undulations in the web, means for applying pressure generally normal to the web to flatten the undulations, and means for applying heat to the web to dry it.

2. Apparatus for shrinking fabric webs, comprising in combination, a traveling web carrier, web-crinkling means adapted to deliver a web to said carrier in an undulated state, and pressure means acting on the web on the carrier to flatten the undulations.

3. Apparatus for shrinking fabric webs, comprising in combination, web-crinkling means for forming undulations in a traveling web, and pressing means acting to flatten said undulations, said pressing means including a pressure surface traveling with the web delivered by said web-crinkling means.

4. Apparatus for shrinking fabric webs, comprising in combination, web-crinkling means for forming undulations in a web, a traveling carrier belt adapted to receive the undulated web, an ironing bed on which the belt travels, a traveling band converging gradually with said carrier belt to press the web thereagainst, and means for heating the web while under such pressure.

5. Apparatus for shrinking fabric webs comprising web-crinkling means for forming in a traveling web undulations adapted for flattening into the plane of the web, and means operating in timed relation to the web-crinkling means for thereafter applying flattening pressure to the undulations while conserving a substantial preceding reduction in dimension caused by the formation of said undulations.

6. Apparatus for shrinking fabric webs comprising web-crinkling means for forming in a traveling web a systematic pattern of undulations

adapted uniformly for flattening into the plane of the web, and means operating in timed relation to the web-crinkling means for thereafter applying flattening pressure to the undulations while conserving a substantial preceding reduction in dimension caused by the formation of said undulations.

7. Apparatus for shrinking fabric webs comprising cooperating web-crinkling means and a web carrier for presenting a continuous web in a dimensionally reduced state in undulations adapted for flattening into the plane of the web, and means operating on the thus presented web to flatten said undulations while substantially conserving the reduced dimension of the web.

8. Apparatus for shrinking fabric webs comprising cooperating web-crinkling means and a web carrier for presenting a continuous web in a dimensionally reduced state in a systematic pattern of undulations adapted uniformly for flattening into the plane of the web, and means operating on the thus presented web to flatten said undulations while substantially conserving the reduced dimension of the web.

9. Apparatus for shrinking fabric webs comprising web-crinkling means for forming in a traveling web undulations adapted for flattening into the plane of the web, pressure means for thus flattening the undulations while conserving a substantial reduction in web dimension represented by the deviation of the undulations from a common plane, and means for conveying the undulated web from said web-crinkling means to said pressure means without substantial extension of the undulations.

SANFORD L. CLUETT.

139 United States District Court District of Columbia Civil Action File No. 2079 ROBERT SEYFARTH v. HON. CONWAY P. COE

Plaintiff's Exhibit No. 1

Endorsed: Filed Jan 14 1941 Charles E. Stewart, Clerk

Department of Commerce

United States Patent Office

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the File Wrapper and Contents, in the matter of the Pending Application of Herbert G. Mayer and Robert Seyfarth, Filed January 21, 1937, Serial Number 121,552, for Improvement in Method of Making Clothing.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed, at the City of Washington, this third day of June, in the year of our Lord one thousand nine hundred and forty and of the Independence of the United States of America the one hundred and sixty-fourth.

Attest:

CONWAY P. COE,
Commissioner of Patents.

(Seal)

D. E. WILSON,
Chief of Division.

141 Endorsed: U. S. Patent Office Jan 28 1937 Div. XXIV.

Endorsed: Mail Division Jan 21 1937 U. S. Patent Office.

To the Commissioner of Patents:

Your petitioners, Herbert G. Mayer and Robert Seyfarth, citizens of the United States, and residents, respectively, of Glencoe, County of Cook and State of Illinois, and Highland Park, County of Lake and State of Illinois, and whose post office address is 212 West Monroe Street, Chicago, Illinois, pray that Letters Patent may be granted to them for the improvement in Method Of Making Clothing (Case 1), set forth in the annexed specification, and they hereby appoint Williams, Bradbury, McCaleb, & Hinkle (Reg. No. 10,473), a copartnership composed of Lynn A. Williams, Clifford C. Bradbury, Albert G. McCaleb, Ross O. Hinkle, Albin C. Ahlberg, J. David Dickinson, Benjamin F. Wupper, Elwood Hansmann, Robert H. Wendt, Warren C. Horton, and Casper W. Ooms, of 2300 Board of Trade Building, Chicago, Illinois, their attorneys, with full power of revocation and substitution, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Signed at Chicago, in the County of Cook, and State of Illinois, this 19th day of January, 1937.

HERBERT G. MAYER
ROBERT SEYFARTH

142 To All Whom It May Concern:

Be it known that we, Herbert G. Mayer and Robert Seyfarth, citizens of the United States, and residents, respectively, of Glencoe, in the County of Cook and State of Illinois, and Highland Park, in the County of Lake and State of Illinois, have invented a certain new and useful improvement in Method of Making Clothing, of which the following is a full, clear, concise and exact description, reference being had to the accompanying drawings forming a part of this specification.

Our invention relates generally to methods of making articles of clothing, and more particularly to improvements in the methods of making cotton clothing, whereby the garments may be made exactly to the required size and whereby they will retain their proper size without appreciable shrinkage.

While our invention is generally applicable to the processes of manufacturing various kinds of clothing, it will be herein described particularly with reference to the manufacture of men's shirts.

In the manufacture of shirts, difficulty has generally been experienced in making garments which will retain predetermined size and proportions throughout their life. In its natural state as grown, a single fiber of cotton is not perfectly straight or smoothly curved from end to end. It is more or less kinky or crinkly or waved. If a single natural fiber having a certain length from end to end be put under a slight tension, these little kinks or crinkles or waves are straightened out in such a way as slightly to increase its length, i. e., the distance from one end of the fiber to the other. When the tension is relaxed, the elasticity of the fiber asserts itself in such a way as to return the fiber to its kinky or crinkly or waved conformation.

143 In converting raw cotton into a finished shirt, there are many operations which can most conveniently and advantageously be performed by putting the several fibers of the cotton under tension, thereby straightening them out to a greater or less extent. There are other operations which can be most conveniently and advantageously performed while holding the several fibers in straightened conformation by the use of binding agents, such as starch or other sizing materials.

When the conveniences and advantages of these various fiber stretching and binding operations are invoked in converting raw cotton into a fully sewn and otherwise finished shirt, it is found that upon washing or laundering the shirt will shrink. We have found, furthermore, that the shrinking will not be in uniform ratio throughout all of the parts and dimensions of the garment. This shrinkage is due to the softening and more or less complete removal of the sizing materials which have theretofore bound and held the several fibers in the straightened conformations given them during a succession of stretching or tensioning operations. Upon the relaxation of the grip of these binding agents, the several fibers of the cotton draw themselves back into their crinkly conformations, thereby shortening each fiber, with a consequent reduction in the dimensions of each piece of cloth and thread incorporated in the shirt.

It is the general object of our invention to provide a method for the quantity manufacture and delivery of finished garments which will retain their predetermined size and shape despite the use of all of the fiber tensioning and stretching and binding agencies which may be convenient or advantageous during many of the steps by which raw cotton is converted into finished and merchandisable garments.

144 The more specific objects of our invention will appear from the following description of our new method.

In the accompanying drawings:

Fig. 1 illustrates a sample of the goods used to ascertain the amounts or percentages of shrinkage in the direction of the warp and in the direction of the weft, respectively;

Fig. 2 shows a standard pattern of a part of an article of clothing representing the desired final shape and size of that piece of the article; and

Fig. 3 shows a pattern of the same piece of the article of clothing, in the size, however, in which it is actually used in the operation of cutting the piece from the fabric.

In accordance with our invention, we bring to the sewing machines the requisite pieces of cloth properly cut to appropriate patterns, each piece of cloth being composed of fibers which have been stretched and straightened, and bound and held in their straightened conformations by such a full complement of sizing material as may be necessary to facilitate cutting and to prevent wrinkling, fraying or unraveling, either in cutting or in sewing or in the handling incident thereto.

The stretching, elongating or straightening of the individual fibers takes place throughout practically all of the steps of the manufacture of the yarn and cloth. In the picker, the fibers are subjected to slight tension. In the card, the fibers are further subjected to slight tension and are laid in generally parallel positions. During the drawing operation the "sliver" is drawn out to reduce it to a yarn by means of the drawing frame. In the slubber, the intermediate, and the roving frames, the strand of fibers is again subjected to tension. In the spinning operation,
the fibers are further stretched and twisted, and part
145 of their natural tendency to assume a wavy or
crinkled shape is overcome. Prior to weaving, the yarns are sized, and the sizing material, upon being dried, holds the fibers in their stretched or elongated condition. During the weaving operation the warp yarn is maintained under a certain amount of tension, while the filler yarn is, during the weaving operations, likewise subjected to a certain amount of tension or stretching. All of these operations further tend to straighten out the fibers and to elongate them slightly, or at least to prevent them from assuming their natural crinkled or wavy conformations. After the "goods" is woven, it is bleached and finished, and during these steps it is repeatedly placed under tension in conveying it to and from the various vats and to the various washers and kiers. During the tentering operation and during calendering, the cloth is again stretched and the fibers thereof slightly elongated, whereupon the sizing is dried so as firmly to hold the fibers in their elongated condition.

As the thread and the fabric are thus being made, there is a repeated tendency to elongate the several fibers, and during these operations this elongation of the fibers is fixed by means of starch, gums, tallows, and various other substances with which the material may be sized. The woven textile fabric thus made and sized will lie flat and smooth upon a cutting table in many layers, and it can be marked and cut to appropriate patterns and subsequently sewn into garments without wrinkling, fraying, or unraveling.

During the weaving operation, the threads of the warp are, as previously stated, subjected to a certain amount of tension. The filler or weft threads are usually, however, subjected to less tension than the threads of the warp. It is probably due to this fact that the shrinkage in the direction of the warp has been found by us to be generally greater than the shrinkage in a direction perpendicular to the
146 warp.

The amount of shrinkage in different fabrics varies greatly. Even in fabrics of the same nominal kind and quality, there is considerable variation in the percentage of shrinkage, and particularly in the percentage of shrinkage in each of the two directions.

In accordance with our invention we cut from each lot of cloth to be used, a rectangular sample 10 (Fig. 1) having its length *a* in the direction of the warp yarn or threads, and width *b* in the direction of the filler or woof yarn or threads. This sample is suitably marked or tagged with the lot number of the fabric from which it is cut and is then thoroughly wetted, preferably by using a suitable wetting out agent, such as a naphthalene sulphonic acid derivative. The wetting is preferably done by gently agitating the cloth in a solution of the wetting out agent, so as to drive out the air adhering to the fibers, and to permit the solution to soften and dissolve the starch, gums, and tallows of the sizing. It is then partially dried without subjecting the threads thereof to tensional strains, as by means of a centrifugal extractor. Thereafter, it is pressed without stretching, as on a flat pressing buck. After being pressed this sample 10 will be found to have shrunk a certain amount represented by the dotted lines 12, 13 of Fig. 1, having a warp length *c* and a filler width *d*. The sample is then accurately measured to determine the exact percentage of shrinkage in the direction of the warp threads and also the exact percentage of shrinkage in the direction of the filler, woof or weft. The percentage of warp shrinkage will be $\frac{100\ (a - c)}{a}$ while the percentage of filler shrinkage will be $\frac{100\ (b - d)}{b}$

147 Having determined the two shrinkage percentages, these may be suitably marked upon the sample and a record made thereof.

Each of the various standard patterns of the pieces to be used in the making of the garment is designed so as to be of exactly the size and shape which the piece is to have in the finished article. One of the standard patterns 14 is shown in Fig. 2. These standard patterns are, however, not used as guides for cutting the pieces from the fabric, but instead serve merely as reference patterns to determine the sizes and shapes of the patterns actually to be used in cutting.

Let us assume that the piece which, in the ultimate finished article, is to have the size and shape of the pattern 14 of Fig 2, is to be cut from the fabric so that the warp shall run in the direction indicated by the arrows in Fig. 2. With this standard pattern 14 as a guide, a new pattern 16 shown in Fig. 3 is made. This pattern 16 will have its dimensions *k* in the direction of the warp greater than the corresponding dimension *m* of the standard pattern 14 by the factor $\frac{a}{c}$ to precompensate for the predetermined shrinkage found in the sample 10. All dimensions parallel to *k* will be similarly increased to determine the corresponding dimensions for the pattern 16. For example, assume that it was found that the sample 10, originally 10 inches long, had shrunk in the direction of the warp to 9.2 inches, thus indicating a warp thread shrinkage of 8 per cent. The pattern 16 of Fig. 3 is therefore made with its dimensions in the direction of the warp threads greater than the corresponding dimensions of the standard pattern in the ratio of 10 to 9.2. The dimensions of the pattern 14 in the direction of the weft are increased in a similar manner in the ratio of *b* to *d* to determine the corresponding dimensions of the pattern 16, thus to compensate for the predetermined shrinkage in the weft direction.

148 Having made patterns similar to 14 for all of the pieces of the garment, the pieces of fabric are cut from the original lot from which the sample 10 was cut, and the pieces of fabric are sewn together to form the requisite article of clothing. The thread used in sewing the pieces together will shrink substantially to the same extent as the fabric pieces which it holds together.

Thereafter, the article of clothing is thoroughly wetted, preferably using a wetting out agent of the character previously specified. During this wetting operation the individual fibers of the various yarns and threads are freed from the constricting effect of the starch, gum, and tallow sizing, etc., which had theretofore retained them in a somewhat stretched or elongated condition. Relieved of these external constraining forces, the individual fibers tend to reassume their original natural shape, and the cloth is thus "shrunk". The wetting process should preferably be very thorough so that each individual fiber may be freed from the external strains upon it. After the garment has been thoroughly wetted, it is partially dried, preferably by means of a centrifugal extractor, to a degree of dryness in which the article is in suitable condition for hot pressing. We have found that during ordinary ironing processes the cloth is again stretched somewhat, and to prevent the stretching of the cloth we preferably use flat pressing bucks for this operation. After the garment has been suitably hot pressed and folded, it is pinned and otherwise prepared for shipment and sale.

The garment will be found to be of exactly the size determined by the original standard patterns exemplified by the pattern 14 of Fig 2, and after repeated ordinary laundering will retain its size and shape without any shrinkage.

149 It is of great advantage to perform the marking, cutting, and sewing operations while the sizing (starch, gums, tallows, etc.) is still in the cloth, because the cloth when sized can be very much more easily and accurately marked, cut, and sewn without fraying and unraveling, and the pieces thereof handled more readily by the operators of the various machines utilized in these operations. Our process has certain definite advantages over any process in which the textile fabric is wetted and shrunk before the pieces are cut therefrom, for, even if the shrinking were thorough, some difficulty would be experienced in producing a product which would retain its required size, because during the manufacture of the garment the cloth would again be subjected to various cutting and sewing operations which would tend to stretch the cloth. However, a greater disadvantage of such process in which the cloth is shrunk before being cut lies in the fact that during the cutting and sewing operations the cloth, because of its lack of sizing, is difficult to handle and tends to fray and unravel. Furthermore, it is not feasible to pre-shrink the thread which is used in sewing the pieces together, and it will be found that this thread will shrink and in some instances tend to produce the effect of shirring or puckering.

In accordance with the method of the present invention, all of these difficulties are overcome, with the result that the garment is finished and delivered for merchandising and sale in exactly the desired permanent size and conformation.

In accordance with our process we individually test each lot of cloth from which the garments are to be made, and we utilize cutting patterns of sizes and shapes completed from the data which is obtained by fully shrinking the sample. Each lot of cloth thus has the pieces of the garment cut therefrom in accordance with patterns individually suited to, or precompensated for, the shrinkage characteristics of that particular lot of cloth in both directions. This is something quite different from merely cutting cer-

tain pieces on the bias or in some other definite direc-
150 tion to obtain a better stretch or "fit", or to accomplish other purposes not relevant to the general or predetermined shrinkage of the fabric of the garment. Due to the fact that all pieces must be cut from the cloth with due regard to the direction of the warp threads as compared with the woof threads, the patterns are each provided with a suitable marking so that they will not be incorrectly laid upon the goods during the operation of cutting.

The method or process of our invention compensates for the warp and filler shrinkage which will take place in each piece of goods, and the amount of such compensation is accurately predetermined for every particular lot of goods from which the garments are made.

The purchaser of the article of clothing, for example a shirt, can be assured that if the shirt fits him the first time he tries it on, it will retain its original size throughout its useful life, and the necessity of haphazardly purchasing a shirt "half a size" or "a size" larger to allow for shrinkage is obviated. Even in the prior practice of buying a shirt slightly oversize, the purchaser frequently found that after the shirt had been laundered several times the neckband would shrink nearly to the proper size but that the sleeves, for example, would not have shrunk sufficiently or would have shrunk more than desired. In some shirts made according to prior art methods, one sleeve might shrink much more than the other due to the fact that one of the sleeves was cut so that its major dimension was parallel with the warp threads, while the other sleeve was cut so that its major dimension was parallel to the weft. All of these disadvantages are overcome by our invention whereby the shirt as sold will initially be of exactly the proper size and will retain its size without shrinkage even after having been laundered scores of times.

151 It will be apparent that some of the advantages of our invention may be secured by employing some of

the steps of our preferred method, without, however, employing all of them.

While we have disclosed a preferred method of clothing manufacture, it will be apparent to those skilled in the art that the method is subject to modification and variation without departing from the general principles herein set forth, and we therefore desire to include within the scope of the appended claims the modified and varied methods or processes by which substantially the same results may be obtained in substantially the same or similar ways.

We claim:

152 1. The method of manufacturing an article of clothing made from a woven fabric which comprises, designing patterns of the various pieces composing the article of clothing, thoroughly wetting a sample of predetermined size of the woven fabric material of which the article is to be made to secure maximum shrinkage thereof, measuring the amount of shrinkage in both the direction of the warp and the direction of the weft, making patterns from those previously designed, in which the dimensions in the direction of the warp are increased by an amount just sufficient to precompensate for shrinkage in the warp direction as determined from said sample of the fabric, and similarly increasing the dimensions of the pattern in the weft direction by an amount just sufficient to pre-compensate for the shrinkage in the weft direction as determined from the shrinkage of said sample, cutting the pieces of the article from the goods of which the sample was taken using the patterns of increased dimensions, sewing the pieces together to form the article of clothing, thoroughly wetting the article, partially drying the article, pressing the article upon a buck and folding it without stretching it, whereby said article will be of the desired size and shape determined by the patterns originally designed.

153 2. The method of making a sewed article of clothing from a woven fabric material which is capable of shrinking which comprises, completely wetting a sample

of each lot of the fabric material, drying said sample without stretching it, measuring the shrinkage of said sample in the direction of the warp threads and perpendicular to said threads, preparing pieces for the article of clothing of dimensions increased from the desired dimensions in the direction of and perpendicular to the warp threads by percentages sufficient to compensate for the shrinkage of the material in its respective dimensions as determined by the shrinkage of said sample, sewing together the pieces to form the article of clothing, thoroughly wetting said article, partially drying said article, and pressing and substantially completely drying said article while the fabric thereof is unstretched.

3. The method of making articles of clothing from woven textile fabrics which comprises, shrinking a sample of the fabric to be used, measuring the shrinkage of the sample in the directions of the warp and woof respectively, cutting the pieces of the article of clothing using patterns the dimensions of which have been increased in one direction by an amount necessary to precompensate for the predetermined shrinkage in the direction of the warp yarn as determined from said sample, and increased in a direction perpendicular to the first named direction by an amount necessary to precompensate for shrinkage in the filler yarn, sewing together the pieces to form the article of clothing, thoroughly wetting the article of clothing to shrink it, and pressing the article while it is free from stretching forces.

154 4. The method of manufacturing an article of clothing made from a woven fabric in which the thread fibers are constrained in elongated condition by starch or the like, which will be softened and partially removed during wetting and upon removal will permit the thread fibers to contract to their normal condition, thereby causing shrinkage in the article of clothing; which comprises cutting the pieces from the starched fabric, sewing the pieces together to form the article of clothing, thoroughly wetting the sewed article by means of water containing a wetting

out agent, and pressing and folding the article substantially without streaching the thread fibers.

155 6. The method of manufacturing an article of clothing made from a sized fabric material, which after complete wetting will shrink to a predetermined size, which comprises, thoroughly wetting a measured sample of the sized fabric from which the article is to be made, partially drying said sample, pressing said sample to complete the drying thereof without subjecting it to mechanical stretching, again measuring the sample to determine the amount which it has shrunk in both the direction of the warp and in the direction of the filler, making working patterns for the various pieces of the article the warp and filler dimensions of which are greater respectively than those desired in the pieces of the finished article by an amount exactly sufficient to precompensate for the warp and filler shrinkage as predetermined from the shrinkage of said sample, cutting pieces from the sized fabric using said working patterns, and sewing said pieces together to form the article of clothing.

156 7. The method of making an article of clothing of sized cloth which when thoroughly wetted will shrink substantially, which comprises cutting a sample from the cloth of which the article is to be made, measuring said sample to determine its length a in the direction of the warp and its width b in the direction of the filler yarn, thoroughly wetting said sample to obtain substantially complete shrinkage thereof, drying said sample without subjecting it to stretching, again measuring said sample to determine its reduced length c in the direction of the warp and its reduced width d in the direction of the filler, preparing a standard pattern for each piece to be used in the article of clothing, said standard patterns being of exactly the size and shape necessary in the finished article, preparing working patterns for each of the pieces, the working patterns having each dimension in the direction of the warp increased relative to the corresponding dimension of the cor-

responding standard pattern by the factor a/c and having each dimension in the direction of the filler increased relative to the corresponding dimension of the corresponding standard pattern by the factor b/d, cutting the pieces from the sized cloth from which said sample was cut using said working patterns as guides, the patterns being properly positioned with reference to the direction of the warp of the cloth, and sewing together the pieces to form the article of clothing.

158 In Witness Whereof, we hereunto subscribe our names this 19th day of January, 1937.

HERBERT G. MAYER
ROBERT SEYFARTH

Oath

State of Illinois, County of Cook, ss.

Herbert G. Mayer and Robert Seyfarth, the above named petitioners, being duly sworn, depose and say that they are citizens of the United States, and residents, respectively, of Glencoe, County of Cook and State of Illinois, and Highland Park, County of Lake and State of Illinois, and whose post office address is 212 West Monroe Street, Chicago, Illinois, and that they verily believe themselves to be the original, first and joint inventors of the improvement in METHOD OF MAKING CLOTHING (Case 1), described and claimed in the annexed specification; that they do not know and do not believe that the same was ever known or used before their invention or discovery thereof, or patented or described in any printed publication in the United States of America or any foreign country before their invention or discovery thereof, of more than two years prior to this application; that said invention has not been patented in any country foreign to the United States on an application filed by them or their legal representatives or assigns more than twelve months prior to this application; and that no application for patent on said improvement has been filed by them or their representatives or assigns in any country foreign to the United States.

HERBERT G. MAYER
ROBERT SEYFARTH

Subscribed and sworn to before me this 19th day of January, 1937.

CLARK V. FOWLER,
Notary Public.

Print of drawing as originally filed.

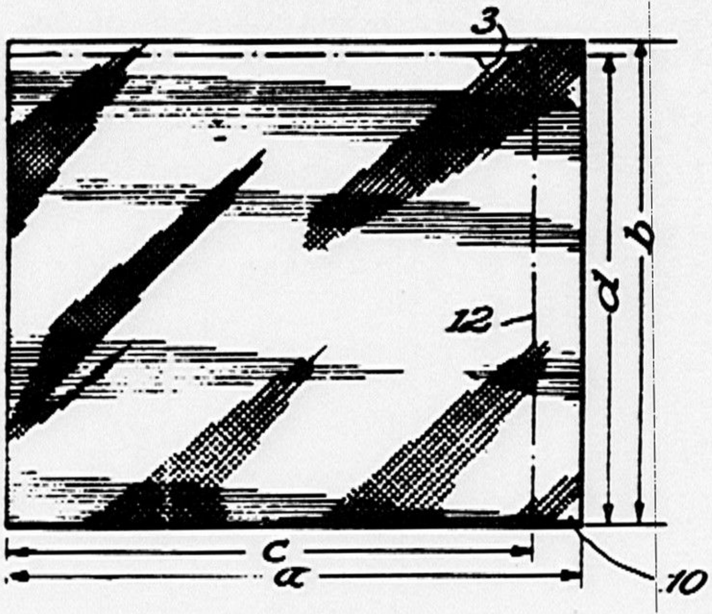


Fig. 1.

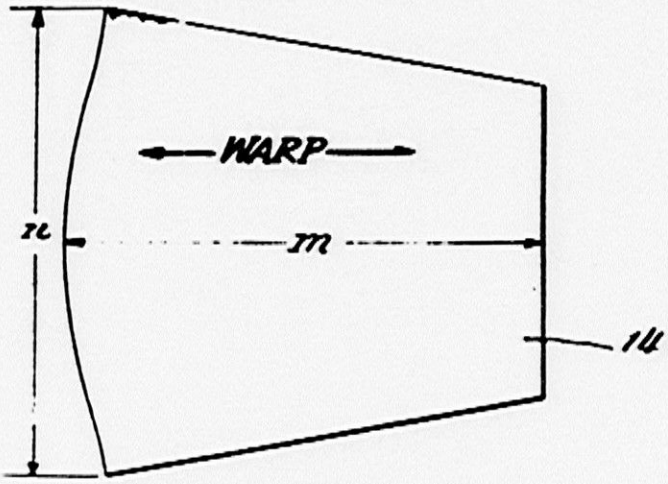


Fig. 2.

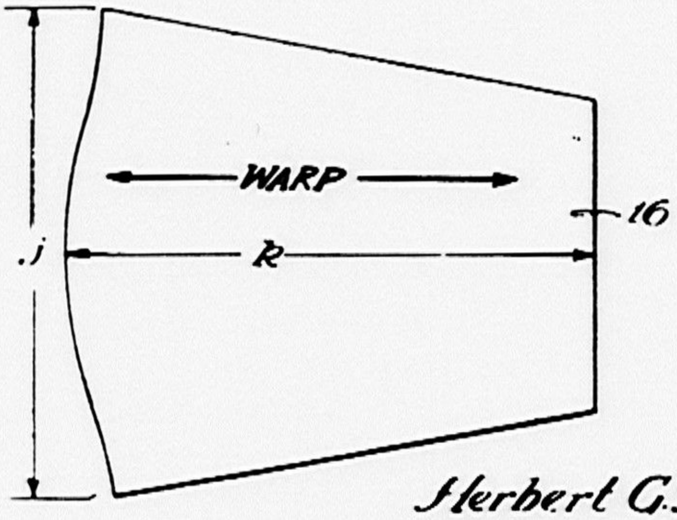


Fig. 3.

Inventors.
Herbert G. Mayer
Robert Seyfarth
By
Williams, Bradbury, McCaleb & Hinkle
Attys.

160 Div. 24 Room 5083 Paper No. 3

Mailed Apr 10 1937

Department of Commerce
United States Patent Office
Washington

MOH/LH

April 10, 1937.

Applicant: Herbert G. Mayer et al.
Ser. No. 121,552
Filed January 21, 1937
For Method of Making Clothing

Williams, Bradbury, McCaleb & Hinkle,
2300 Board of Trade Building,
Chicago, Illinois.

Reference made of record:—
Ainslie 1,480,541 Jan. 15, 1924 2-143.

The "public use or sale" clause has been omitted from the oath. A new oath properly identifying the application accordingly is required.

Each of the claims is rejected on Ainslie as failing to patentably define therefrom. This patentee teaches that it is old to construct portions of a garment to allow for shrinkage after assembly. No invention is seen in going a step further and specifically determining by the use of a sample the exact amount this material will shrink. The difference is merely colorable, presenting a mere refinement in art, and does not amount to invention. Attention is called to the decision in *In re Williams,* 392 O. G. 737, 1930 C. D. 97, where it was stated:—

"It is a settled principle of law that the mere carrying forward of an original patented conception involving only change of form, proportions or degree . . . is not such an invention as will sustain a patent even though the changes of the kind may produce better results than prior inventions".

Also, if applicants have discovered a new method of shrinking material (that is, the sample) it should be so claimed and not as a "method of manufacturing an article of clothing". Each of the claims accordingly is further rejected as failing to set forth any invention in garment manufacture.

C. A. DURAS,
Examiner.

161 U. S. Patent Office Div. XXIV Oct 12 1937

Mail Division U. S. Patent Office Oct 11 1937

United States Patent Office

Applicants: Herbert G. Mayer and Robert Seyfarth

Case, 1
Div. 24
Room 5083

Invention: Method of Making Clothing

Serial No. 121,552 Filed—January 21, 1937

2300 Board of Trade Building,
Chicago, Ill.—October 5, 1937.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In response to Office Action, Paper No. 3, dated April 10, 1937, applicants amend their above entitled application as follows:

Claim 1, line 9, after "amount" insert—just—; Line 12, after "amount" insert—just—; Line 18, erase "by means of a centrifugal extractor".

Claim 2, line 14, change "unstrained" to—stretched—.

Claim 4, lines 3 and 4, erase "dissolved and more or less completely" and substitute therefor—softened and partially—; Line 4, change "washing" to—wetting—.

Claim 6, line 5, before "drying" insert—partially—; Same line, erase "and" and substitute—said sample,—;

Same line, before "without" insert—to complete the drying thereof—; Line 6, change "strains" to—stretching—.

162 Claim 7, line 2, erase the comma (,), first occurrence; Line 6, erase ",drying"; Erase line 7; Line 8, erase "substantially complete shrinkage thereof," substituting therefor—to obtain substantially complete shrinkage thereof, drying said sample without subjecting it to stretching,—; Line 13, erase "indicating"; Erase line 14; Line 16, erase "having the direction of the warp indicated thereon and—; Line 18, change "on" to—of—; Line 21, change "on" to—of—; Line 23, erase the comma (,), first occurrence, and after "guides," insert—the patterns being properly positioned with reference to the direction of the warp of the cloth,—.

Remarks

The above amendment is made pursuant to an oral interview with the Assistant and Primary Examiners, at which the merits of applicants' process were fully discussed, not only as compared to the process disclosed in the Ainslie et al patent, but also with reference to other known preshrinking processes, particularly the "Sanforizing" process.

The amendments to claim 1 have been made in an endeavor to relieve this claim of possible ambiguity by specifying that the dimensions of the patterns are increased by an amount "just" sufficient to precompensate for the shrinkage. As the claim previously read, the dimensions might be increased by an amount more than just sufficient to precompensate for the shrinkage. The limitation
163 in the claim that the article shall be partially dried
"by means of a centrifugal extractor" has been removed, since other means for drying the article may be employed without affecting the results obtained by the process as a whole.

The word "unstrained" has been changed to "unstretched" in claim 2, since the Assistant Examiner pointed out that when the article was being pressed, the fabric might be considered as being subject to a compressive strain.

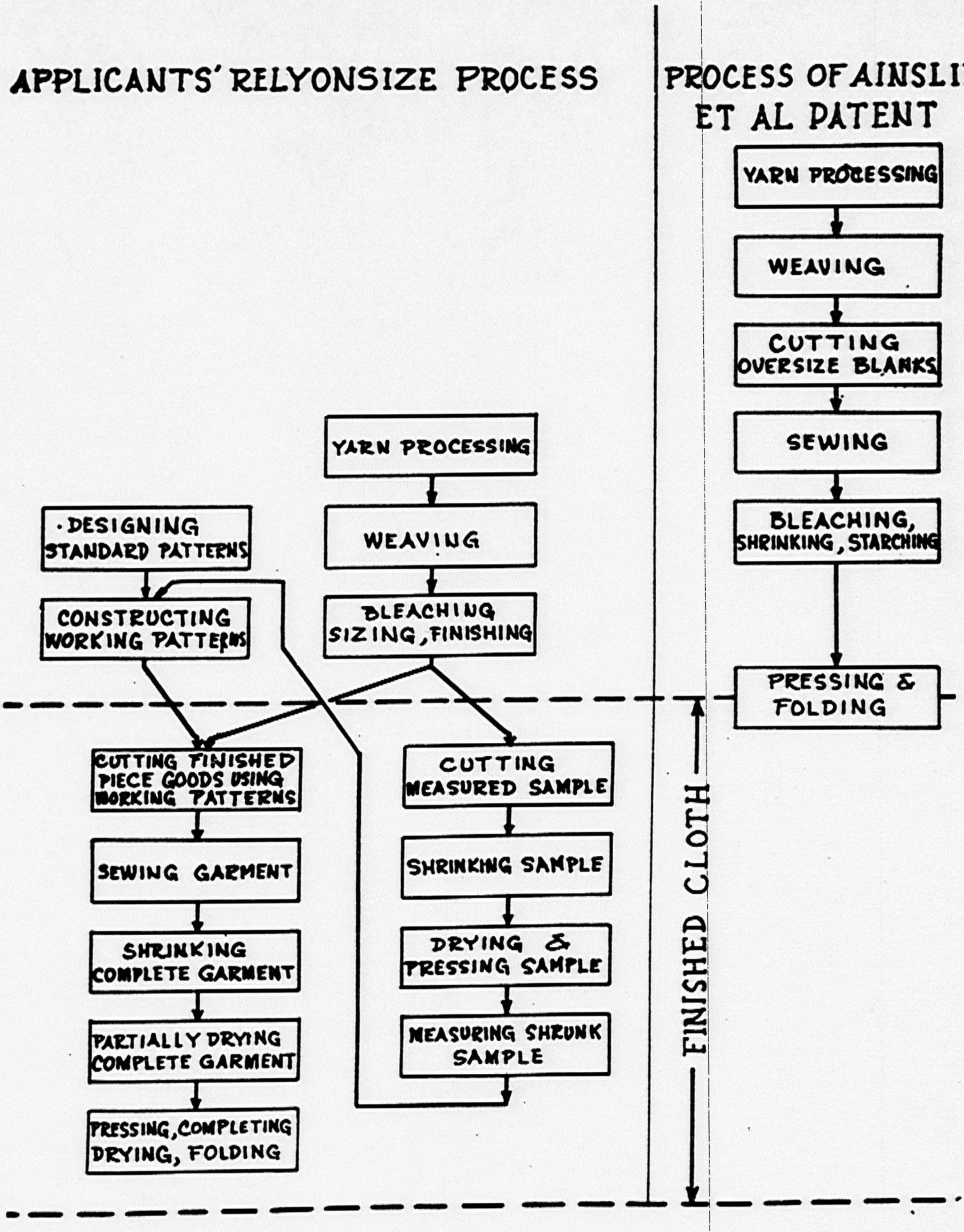
The remaining claims retained have each been amended to relieve them of possible ambiguity, and to render them more clearly definitive of applicants' invention.

Applicants are submitting herewith a substitute oath to take the place of that originally filed with the application.

A reconsideration of the rejection of the claims of this application upon the patent to Ainslie et al is respectfully solicited. Briefly, this application discloses a method of manufacturing collars whereby unshrunk gray piece goods is cut to form oversize blanks, the blanks sewed together to form the collar, and the collar then bleached, shrunk, and starched, whereafter it may be pressed and folded. The patentees were interested in devising a process whereby the steps of bleaching and finishing the piece goods could be eliminated from the mill operations performed upon the cloth, and instead, this operation is later performed upon the sewed collar. In carrying out the method disclosed in this patent, the cloth composing the collar has all of the operations performed upon it (with the exception of the final pressing and folding operations) while the cloth is in a soft, flexible condition and substantially free from starch and other sizing. In this condition, the cloth cannot be handled
by the cutters and sewing machine operators as eas-
164 ily as a finished cloth, because cloth lacking the
starched sizing ravels more readily and stretches more easily than sized cloth. Ainslie et al apparently were willing to accept this disadvantage in the operations of cutting and sewing in order to obtain the advantage of bleaching the finished collars rather than bleaching the piece goods.

The steps of applicants' process differ greatly from those employed by Ainslie et al. These differences are clearly illustrated in the block diagrams which appear upon the following page. By reference to these diagrams it will be seen that the process of applicants' invention is performed mainly upon finished cloth, whereas according to the Ainslie process, the cloth is not finished until the last step in the operation of pressing and folding. This is a vital distinguishing feature in comparing these two processes, because all of the cutting and sewing operations in accordance with applicants' method are performed upon a finished, sized cloth which holds its shape well, does not ruffle readily, and lies flat so that it is very easy for the cutters to handle it and for the various sewing machine operators to feed to their respective machines. When it is considered that as many as forty-two operations may be necessary to complete even such a relatively simple garment as a work shirt, the great advantage of having the cloth in a state in which it may be easily and quickly handled becomes apparent.

The only statement contained in the Ainslie et al patent which appears to applicants' attorneys to be relevant to the subject matter claimed refers to the fact that Ainslie et al suggested using oversize patterns so as thereby to allow for shrinkage. This suggestion appears on page 1, lines 63 to 67, and also on page 2, lines 10 to 14. However, the statements there made add very little to the well known


APPLICANTS' RELYONSIZE PROCESS
PROCESS OF AINSLIE ET AL PATENT
YARN PROCESSING
WEAVING
CUTTING OVERSIZE BLANKS
SEWING
BLEACHING, SHRINKING, STARCHING
PRESSING & FOLDING
DESIGNING STANDARD PATTERNS
CONSTRUCTING WORKING PATTERNS
YARN PROCESSING
WEAVING
BLEACHING SIZING, FINISHING
CUTTING FINISHED PIECE GOODS USING WORKING PATTERNS
SEWING GARMENT
SHRINKING COMPLETE GARMENT
PARTIALLY DRYING COMPLETE GARMENT
PRESSING, COMPLETING DRYING, FOLDING
CUTTING MEASURED SAMPLE
SHRINKING SAMPLE
DRYING & PRESSING SAMPLE
MEASURING SHRUNK SAMPLE
FINISHED CLOTH

166 and admitted practice of housewives making a garment somewhat oversize so as to "allow for shrinkage". But both the housewife and Ainslie et al had no means for estimating accurately the amount of shrinkage which would take place, nor did Ainslie et al indicate that there was any particular merit or demerit in the way in which the patterns were laid upon the piece goods, i. e., with reference to the direction of the warp threads of the latter. The Ainslie et al patent thus merely repeated the age old suggestion to cut the pieces of the goods a little bit larger if the garment is expected to fit after it has been laundered. That Ainslie et al did not appreciate the problem is indicated by the fact that they suggested on page 2, line 11 that the blanks be cut between 15½ and 15¾ size. They had no means of predetermining whether the blanks should be cut to 15½, 15¾, or for that matter, 16 or 16¼, and thus their method was the same as that employed by the home dressmaker who allows a little here and there in making up a garment, in the hope that the allowances may somewhat approximate the shrinkage which will take place.

From the diagrams appearing on page 4a hereof, it will be noted that applicants' process differs widely from that of Ainslie et al. Applicants include as steps in the process cutting a sample from each lot of piece goods to be used in making shirts, measuring and then fully shrinking this sample, determining the percentage of shrinkage in both the direction of the warp threads and in the direction of the filler threads. Thereafter, the shrinkage percentages thus obtained are utilized in predetermining the sizes of the pieces of the garment which is cut from the same lot of piece goods, the dimensions of a standard pattern for a particular garment of a particular size being increased by these percentages to produce working patterns or "markers".

167 A very important consideration involved in the use of the working patterns is that they be laid properly upon the piece goods, with reference to the direction of the warp and filler threads, since the standard pattern

dimensions are not increased equally, but those dimensions in the direction of the warp are increased by the percentage necessary to precompensate for the predetermined shrinkage in the warp threads, while the dimensions in the direction of the filler threads are increased sufficiently to precompensate for the predetermined shrinkage in the direction of the filler threads. The pieces of the garment are cut from finished (i.e., sized and calendered) piece goods which is easy to handle during the cutting operation, and which may be smoothly and easily fed to the sewing machines and other machines which perform operations upon the garment. After the garment has been completely sewed, the garment as a whole is shrunk. This shrinkage is necessarily exactly as was predetermined by the sample, and, compensation having been made for the shrinkage, the garment will shrink exactly to the size determined by the standard patterns.

It has been found that the shrinkage in the direction of the warp may be in the order of 8%, while that in the direction of the filler yarn may be in the order of 3%. Upon a similar material, but of a different lot, the shrinkage in the direction of the warp might be 6%, while that in the direction of the filler yarn was 5%. In fact, in some materials, the shrinkage in the direction of the filler yarn may be even greater than that in the direction of the warp. Thus, any haphazard pre-allowance for shrinkage, as suggested by Ainslie et al, could not be effective, and the employment of the guess method proposed by Ainslie is undoubtedly the cause of the exasperating condition frequently encountered by the housewife in endeavoring to iron collars. 168 Unless both layers of a collar or similar two-ply portion of an article of clothing are made in such a manner that they will shrink to exactly the same size in their corresponding dimensions, one layer or ply will shrink more than the other, and thus cause a ballooning or fullness which it is practically impossible to iron out of the garment.

In view of the fact that the disclosure of the Ainslie patent so clearly and unquestionably fails to anticipate applicants' invention, it was believed (and confirmed at the oral interview with the Examiner) that the rejection was based less upon the ground of direct anticipation by the Ainslie et al patent than upon a contention that applicants' process lacked "invention" in view of the Ainslie patent, and possibly also in view of well known preshrinking processes wherein the goods is shrunk and the article of clothing manufactured from this preshrunk piece goods. For this reason, applicants submit herewith the affidavit of Mr. Herbert G. Mayer, one of the joint inventors and President of Reliance Manufacturing Company, assignee of this application.

On the question of what is and what is not "invention", millions of words have been written and many books and articles have been published. There is hardly a decision in a patent case in which there is not some attempt made to apply one or another of the numerous tests of invention. Among the numerous authorities upon the question, there is, however, none which appears to applicants' attorneys so completely and thoroughly to cover the subject as the decision of Judge Hough in Kurtz et al. vs. Belle Hat Lining Co., Inc., 280 Fed. 277, and since this decision relates to a patent on an article of clothing, it is believed to be particularly relevant in the discussion of the merits of the present application.

169 In his opinion (page 279), Judge Hough quoted professor Robinson's dictum that, "The mental faculties involved in the inventive act are creative and not imitative". In the present application, the inventors' acts did not imitate Ainslie et al nor any of the other preshrinking methods in use, but departed from the beaten path and created an entirely new process.

Judge Hough then quoted from General Electric vs. Sangamo, 174 Fed. 246, 251, as follows:

"Invention, in the nature of improvements, is the double mental act of discerning, in existing machines or processes or articles, some deficiency, and pointing out the means of overcoming it."

Applicants discerned the deficiency in the preshrinking method which was commonly used and is still used by many manufacturers of clothing. This deficiency was that during the operations of manufacturing an article of clothing from preshrunk piece goods, the cloth was stretched and strained by the numerous cutting and sewing operations, and as a result, the beneficial effect of the preshrinking was partially lost. In this application, applicants have clearly pointed out a new process for overcoming this deficiency in the prior art methods and processes.

The quotation from Cunningham vs. Æolian, appearing on page 280 of Judge Hough's opinion, applies directly to the facts in this application, especially as set forth in the affidavit of Mr. Mayer.

While Judge Hough appreciated the value of presumptions and inferences implied in such attempted definitions of the term "invention", Judge Hough preferred to decide this question "on the evidence".

As one of the factors constituting evidence of invention, Judge Hough quoted the opinion in Warren, etc., Co. v. American, etc., Co., 133 Fed. 304, 306, as follows:

170 " * * * 'In determining this question it is proper to bear in mind the condition of the trade as well as the art to which the patent in suit is allied.' "

In the instant case, the invention relates to an old and well developed art, and the affidavit of Mr. Mayer shows, that one of the leading manufacturers in this art, the Reliance Manufacturing Company, has never during the 39 years it has been engaged in this business had sufficient confidence in the methods of preshrinking which were used to enable it absolutely to guarantee to the customer a new shirt free if it could be shown that a "Relyonsized" shirt made in accordance with the method of this invention, had shrunk.

Judge Hough, in his opinion, continued by stating:

"And similarly that the 'effort (of the court) must always be to view the subject matter from the standpoint of the art concerned.' Kurtz v. Blatt, * * * 263 Fed. 392, 394."

If it is the duty of a court to view the subject matter from the standpoint of the art concerned, it is believed to be likewise the duty of the Patent Office tribunals similarly to view the subject matter of an invention. In the words of the president of one of the largest manufacturers of work shirts in this country, the present invention "is, from a commercial point of view, a startling innovation, and that it presents an exceedingly promising future; and, based upon this belief, the manufacturing methods of Reliance Manufacturing Company are being changed as rapidly as the increasing demand warrants, with the expectation that eventually all shirts produced by it shall be made in accordance with this method." (last paragraph Mayer affidavit)

Judge Hough's opinion continues (page 281) with a statement that "the nature of an invention is usually ascertained from examining the inventive act from which patented matter results; for invention always generates 171 a new idea, although a patentee must create the means, and not merely perceive the end."

In the present case, applicants have not only perceived the end, i.e., the desirability of having a shirt which would be fully preshrunk, and could be warranted to be fully preshrunk, but they also created the process by which this end could be obtained.

Judge Hough next discusses simplicity, cheapness, and utility, as evidence of invention. In the present case, the process is cheaper especially when the resulting product is compared with that producible by other methods equally costly. As to utility, it is submitted that it is self-evident that a method by which a fully preshrunk shirt may be produced has great utility compared with other processes whereby only a partial preshrinking is obtained in the finished product. In the sense that applicants' invention utilizes many well known steps in the art of manufacturing clothing, it is an extremely simple process, but as stated by the Supreme Court in Diamond Rubber Co. vs. Consolidated Rubber Tire Co., 219 U. S. 432, "Its simplicity should not blind us as to its character. Many things, and the patent law abounds in illustrations, seem obvious after they have been done, and 'in the light of the accomplished result' it is often a matter of wonder how they so long 'eluded the search of the discoverer and set at defiance the speculations of inventive genius'."

Judge Hough also cited the case of Consolidated, etc., Co. vs. Window Glass Co., 261 Fed. 362, 375, wherein, "simplicity alone, though 'cited as evidence of lack of invention, to our minds shows a high order of novelty and invention.' "

Although the steps in applicants' process are relatively
simple, their order in the process departs radically
172 from the prior methods of manufacturing clothing,
and therefore the relative simplicity of the various
steps should be considered not as evidence of lack of invention, but on the contrary, as evidence of a "high order of novelty and invention".

Upon the subject of commercial success, Judge Hough considered it of questionable safety as a guide although one which has always "been a powerful piece of evidence, especially when the prior art shows no success along the same lines".

Applicants' attorneys agree with the general statement that commercial success is not always evidence of invention because obviously a device may be commercially successful because of very many other factors than that of novelty or invention. However, in the present case, we have peculiar fortuitous circumstances which show that the commercial success of the process disclosed in this application should be attributed mainly to the inventive character thereof, rather than to other extraneous facts, such as the appearance of the goods, advertising, etc., which sometimes are controlling factors.

In the affidavit of Mr. Mayer, it is shown that the Reliance Manufacturing Company makes three kinds of work shirts by three different processes, the resultant shirts being substantially identical in appearance. Thus, any preference by the purchasing public for one kind of shirt over the others must be attributable to the inherent qualities of the shirt resultant from the process by which it was made, rather than to the dress of the goods or the sales effort expended to sell it. Obviously, the Reliance Manufacturing Company is willing and ready to sell each of the three kinds of shirts, depending upon the requisitions of the customer. The affidavit of Mr. Mayer, however, shows that during the short period of eight months which 173 followed the introduction period in the marketing of shirts made according to the "Relyonsized" process of this application, the demand for "Relyonsized" shirts increased by 250%. In other words, while 20% of the preshrunk shirts sold by Reliance Manufacturing Company in January 1937 were "Relyonsized" shirts, over 50% of the preshrunk shirts sold by this company during August 1937 were made by the "Relyonsized" process.

During the course of the recent interview with the Examiners relative to this application, the Primary Examiner cited the case of Johnson vs. Lit Bros., 278 Fed. 279, the opinion of which is to the effect that commercial success of an article of clothing cannot be considered as evidence of invention because, generally speaking, there will be large sales of articles of clothing, whether they incorporate an inventive feature or not. The reasoning in said opinion appears to apply properly to the facts before the court in that case, but, it is respectfully contended, it is not applicable to the facts in the present case, as set forth in the affidavit of Mr. Mayer, because it is shown by said affidavit that the relative proportions of shirts manufactured in accordance with the "Relyonsized" process, as compared with shirts manufactured in accordance with the prior art preshrinking processes, increased rapidly even though the different shirts were of identical appearance.

That commercial success in a proper case may be considered evidence of invention is borne out by the decision of the Third Circuit Court of Appeals in Globe Knitting Works vs. Segal et al., 248 Fed. 495, wherein the court, which constituted the appellate tribunal for Judge Dickinson, who decided the Johnson vs. Lit Bros, case, stated:

"Simple as it may seem, the elastic knit crotch
174 piece produced results desired by those who wear
the garment and the payment of large tribute by
those who manufacture it. When the question of invention is close, as it usually is when the thing done is simple, the thing achieved, its recognition by the art, and the demand for it by those who use it, are matters properly to be put in the scale and weigh in favor of invention. Neill v. Kinney, 239 Fed. 309-314, 152 C. C. A. 297. We find the patent valid."

Reverting to the opinion in Kurtz vs. Bell Hat Lining Co., Judge Hough continued (page 282) the list of facts evidentiary of invention, by including "marked superiority of the article" and "a marked improvement in the product". There can be no doubt whatsoever that applicants' process results in a product which is a marked improvement over similar products manufactured by the prior art methods.

Judge Hough also stated that patentability had often been found " 'in discovering what is the difficulty with an existing structure' and correcting the same, even though 'the means' are old and their mere 'adaptation to the new purposes involves no patentable novelty.' Miehle, etc., Co. v. Whitlock, 223 Fed. 647, 650."

Certainly applicants have been successful in discovering the difficulties of the prior art processes and have succeeded in correcting the same, even though the particular steps of their process may have been old for other purposes.

Judge Hough concluded his discussion of what may be evidence of invention with the statement:

"Hindsight, or wisdom after the fact, has always been looked upon with disfavor; * * * "

Those who are well versed in the art but who have never been confronted with a problem requiring a novel solution,

and who have not spent months in tireless efforts to
175 find a solution, and who have not finally arrived at a solution, and who have not risked large amounts of capital upon their judgment that their solution was the correct one, such people are prone to be imbued with "wisdom after the fact", and to conclude that the solution was an obvious one.

It is believed that applicants have made a very meritorious contribution to the art of clothing manufacture and that their efforts should be rewarded by the grant of a patent. The claims remaining in this application are now clearly limited to their contribution to the art, and are believed to be in proper form for allowance. Such final action is respectfully solicited.

Respectfully submitted,

HERBERT G. MAYER and
ROBERT SEYFARTH

By WILLIAMS, BRADBURY,
McCALEB & HINKLE
Attorneys

---

176 U. S. Patent Office Oct 12 1937 Div. XXIV
Mail Division Oct 11 1937 U. S. Patent Office

United States Patent Office

Case 1 Div. 2b Room 5083

Applicants: Herbert G. Mayer and Robert Seyfarth
Invention: Method of Making Clothing
Serial No. 121,552

Filed—January 21, 1937.

Affidavit of Herbert G. Mayer

State of Illinois,
County of Du Page, ss.

Herbert G. Mayer, being duly sworn, deposes and says that he is one of the joint inventors who filed the above entitled application, and that he is President of Reliance Manufacturing Company, of Chicago, Illinois, assignee of said application.

That the method of making clothing disclosed in said application has been used in the manufacture of shirts by said corporation for a period of approximately one year, and that the method has proved highly satisfactory in actual commercial use, making it possible to manufacture shirts which are much more satisfactory to the user than shirts which have been manufactured in the customary manner or by other known pre-shrinking processes.

That shirts manufactured in accordance with the method disclosed in this application have been sold by Reliance Manufacturing Company exclusively under the trade name "Relyonsized".

That he is of the opinion that the method of manufacturing clothing disclosed in said application results in articles which are far superior to those manufactured by other processes.

177 That Reliance Manufacturing Company makes work shirts by three different manufacturing processes. The first process involves cutting and sewing the unshrunk piece goods without at any time wetting or shrinking the cloth. Shirts made according to this first process are customarily made oversize, so that when laundered by the user they will shrink to a size roughly approximating the nominal size. A second process of manufacture employed nominal size. A second process of manufacture employed by Reliance Manufacturing Company involves the use of preshrunk piece goods and cutting and sewing the pre-shrunk goods to make the finished shirt. Shirts made in accordance with this second process are fairly satisfactory, but are nevertheless subject to considerable shrinkage due to the fact that in the process of manufacturing the shirt, the cloth is repeatedly subjected to operations which stretch it and partly neutralize the beneficial effect of the pre-shrinking operations. The third process of manufacturing work

shirts employed by Reliance Manufacturing Company is the "Relyonsized" process disclosed in said application. Shirts made according to this process are of the correct nominal size when sold, and are not subject to measurable shrinkage.

That Reliance Manufacturing Company makes work shirts according to these three processes which are of identical style and cut, and of identical goods, the shirts of the three different types being identical in appearance upon casual inspection.

That the sales of "Relyonsized" shirts during the last quarter of the calendar year 1936 amounted to $3,027.00, and during the year 1937, from January to August inclusive, the sales of "Relyonsized" shirts by Reliance Manufacturing Company has amounted to $101,673.00.

That the demand for "Relyonsized" shirts has been steadily increasing during the year 1937 is indicated
178 by the fact that whereas approximately twenty per cent. of the pre-shrunk shirts sold by Reliance Manufacturing Company during January 1937 were manufactured by the "Relyonsized" method, over fifty per cent. of the pre-shrunk shirts manufactured by said company during August of this year were manufactured by this method. The advantages of "Relyonsized" shirts as compared with shirts made by other processes is, in his opinion, the controlling factor which caused customers to purchase such an increased proportion of "Relyonsized" shirts.

That of the total of $104,700.00 worth of "Relyonsized" shirts which have been sold, not a single complaint regarding shrinkage has come to his attention, as such complaint normally would if made by any customer, and this despite the fact that the Reliance Manufacturing Company has sold each shirt with a label guaranteeing replacement of the shirt without charge should the shirt shrink. This, in his opinion, shows the effectiveness of the method of making shirts disclosed in said application.

That although Reliance Manufacturing Company has been engaged in the business of manufacturing and selling shirts for a period of thirty-nine years, it has never, previous to the marketing of "Relyonsized" shirts, made an offer to replace a shirt if it shrunk, because by the methods of manufacturing shirts and other articles of clothing previously used, (which included the most common pre-shrinking methods,) the amount of shrinkage which would occur was always sufficiently great to make it impossible for the Reliance Manufacturing Company to make a guarantee offer of this character.

That sample "Relyonsized" shirts, made according to the method disclosed in said application, were submitted to the United States Testing Company, having an
179 office at Chicago, Illinois, and to the Better Fabrics Testing Bureau, Inc., the "Official Laboratory of the National Retail Dry Goods Association", of New York City, for purposes of test; that these testing companies are independent, disinterested, companies making a business of rendering unbiased reports upon goods and materials submitted to them for examination and test; that the attached photostat marked "Exhibit A", Mayer Affidavit" is a true and exact copy of the report by the Better Fabrics Testing Bureau, Inc. of a test made by it on six "Relyonsized" shirts; and that the attached photostat marked "Exhibit B, Mayer Affidavit" is a true and exact copy of the report of United States Testing Company relative to a shrinkage test of six "Relyonsized" shirts. That the reports "Exhibits A and B" confirm numerous tests and experiments made by others and by employees of Reliance Manufacturing Company and which was reported to him, such tests all showing that "Relyonsized" shirts are fully pre-shrunk and very accurately maintain their correct size and shape throughout numerous ordinary laundry treatments.

That he believes that the method of manufacturing clothing disclosed in said application, is, from a commercial point of view, a startling innovation, and that it presents an exceedingly promising future; and, based upon this belief, the manufacturing methods of Reliance Manufacturing Company are being changed as rapidly as the increasing demand warrants, with the expectation that eventually all shirts produced by it shall be made in accordance with this method.

Further deponent sayeth not.

HERBERT G MAYER

Subscribed and sworn to before me this 8th day of October, 1937.

FRANK K MANN
Notary Public

180 *Exhibit A—Mayer Affidavit.*

Better Fabric Testing Bureau, Inc.

Official Laboratory of

National Retail Dry Goods Association

101 West 31st St., New York City

September 17, 1936

Reliance Manufacturing Company
212 West Monroe Street
Chicago, Illinois

Gentlemen:

Six Relyonsized gray covert Big Yank shirts have been laundered six times by this laboratory in a home type washer.

The results of our measurements before and after six launderings indicate that these shirts are fully pre-shrunk and will not shrink during typical laundry treatment.

Each shirt stretched exactly to its marked size, and all possessed good color fastness to laundering, showing no appreciable fading of color or change in original appearance.

Yours very truly

BETTER FABRICS TESTING BUREAU, INC.
Official Laboratories (N. R. D. G. A.)
SM
EF

Official Retail Laboratories

181 *Exhibit B—Mayer Affidavit.*

United States Testing Company
Incorporated

Chicago Testing House

11118 Merchandise Mart

Telephone Superior 3870

Hoboken, New York, Philadelphia, Patterson, Providence, Woonsocket, Chicago, Greensboro.

Main Office, Hoboken, N. J. Cable Address USTESTCO, Hoboken, N. J.

Chicago, Illinois, September 9, 1936

Reliance Manufacturing Co.,
212 W. Monroe St.,
Chicago, Illinois.

Gentlemen:

This is to advise that we have received and tested six "Relyonsized gray covert Big Yank" shirts for shrinkage. These shirts were given *three* typical laundry treatments and under such conditions that any shrinkage could be determined at once.

Although one treatment is usually sufficient, these shirts were subjected to *three* laundry washings to develop any possible shrinkage.

The comprehensive tests given these "Relyonsized Big Yank" shirts show that all are fully preshrunk and will withstand without shrinkage the usual laundry treatments.

Yours very truly,

CHICAGO TESTING HOUSE

J. A. NARY,
Manager.

J. A. NARY
Blu

182 U. S. Patent Office, Oct 12 1937 Div XXIV

Mail Division Oct 11 1937 U. S. Patent Office

United States Patent Office

Case 1 Div. 24 Room 5083

Applicants: Herbert G. Mayer and Robert Seyfarth.

Invention: Method of Making Clothing.

Serial No.: 121,552. Filed January 21, 1937.

Substitute Oath

State of Illinois, County of Du Page, ss.

Herbert G. Mayer and Robert Seyfarth, the above named petitioners, being duly sworn, depose and say that they are citizens of the United States, and residents, respectively, of Glencoe, County of Cook and State of Illinois, and Highland Park, County of Lake and State of Illinois, and that they verily believe themselves to be the original, first, and joint inventors of the improvement in METHOD OF MAKING CLOTHING (Case 1) described and claimed in their application Serial No. 121,552, filed January 21, 1937; that they do not know and do not believe that the same was ever known or used before their invention or discovery thereof, or patented or described in any printed publication in the United States of America or any foreign country before their invention or discovery thereof, or more than two years prior to said application, or in public use or on sale in the United States for more than two years prior to said application; that said invention had not been patented in any country foreign to the United States on an application filed by them or their legal representatives or assigns more than twelve months prior to said application; and that no application for patent on said improvement has been filed by them or their representatives or assigns in any country foreign to the United States.

HERBERT G. MAYER
ROBERT SEYFARTH

Subscribed and sworn to before me this 5th day of October, 1937.

FRANK K. MANN,
Notary Public.

183 U. S. Patent Office Oct 18 1937 Div. XXIV.

Mail Division Oct 16 1937 U. S. Patent Office

United States Patent Office

Case 1 Div. 24 Room 5083

Applicants: Herbert G. Mayer and Robert Seyfarth
Invention: Method of Making Clothing
Serial No.: 121,552 Filed—January 21, 1937

2300 Board of Trade Building,
Chicago, Ill.—October 14, 1937

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Supplemental to amendment filed on October 11, 1937, please amend the above entitled application as follows:

Claim 2, line 14, change "stretched" to—unstretched—.

Remarks

The above amendment is necessary to correct a typographical error in the amendment of October 11, 1937.

Respectfully submitted,

HERBERT G. MAYER
ROBERT SEYFARTH

By WILLIAMS, BRADBURY, McCALEB & HINKLE,
Attorneys.

---

184 Mailed Dec. 4, 1937 U. S. Patent Office

Div. 24 Room 5083 Paper No. 6

Department of Commerce
United States Patent Office
Washington

MOH/LH

December 4, 1937.

Applicant: Herbert G. Mayer, et al.
Ser. No. 121,552
Filed January 21, 1937.
For Method of Making Clothing.

Williams, Bradbury, McCaleb & Hinkle,
2300 Board of Trade Building,
Chicago, Illinois.

The amendments of October 11 and 16, 1937, have been incorporated.

Additional references made of record:

"Textiles and Clothing" by Kate Heintz Watson, published in 1925 by American School of Home Economics. Received by U. S. Patent Office Nov. 10, 1925. Copy may be found in Div. 24 of U. S. Patent Office. Only page 212 is necessary.

The new oath has been received and is found to be satisfactory.

Each of the claims is rejected on Ainslee for the reasons of record. The *only steps* relied upon by the Examiner as a basis for rejecting the claims are those of cutting oversize blanks and thereafter shrinking them as specifically recited in the paragraph beginning with line 6 of page 2. The steps such as bleaching and sizing and their relative sequence with respect to the cutting and shrinking steps are *not* relied upon and, moreover, are not regarded as material. In other words, the claims present no invention over these steps (cutting and shrinking of a woven fabric) *alone*. The use of a sample for determining the exact percentage of shrinkage along the warp and weft, the cutting of the patterns larger by this percentage, and the wetting, drying and pressing of the article thereafter without stretching, cannot be depended upon to import patentability. Moreover, attention is directed to the second paragraph of the passage headed "Preparation of Material." on page 212 of the above referred to publication, wherein it is stated:

"Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed and measured again to determine the percentage of shrinkage".

185 Accordingly, no invention would be further involved in employing *a sample* to precisely determine the amount the Ainslee article will shrink, in view of the teaching of this disclosure. The claims are each accordingly further rejected on Ainslee in view of the above quoted disclosure, and still further rejected in view of the above quoted disclosure alone.

C. O. DURAS
Examiner

186 U. S. Patent Office Jan 6—1938 Div. XXIV.

Mail Division Jan—5 1938 U. S. Patent Office

United States Patent Office

Applicants—Herbert G. Mayer and Robert Seyfarth
Invention—Method of Making Clothing
Serial No.—121,552 Filed—January 21, 1937

Case 1 Div. 24 Room 5083

2300 Board of Trade Building,
Chicago, Ill., January 3, 1938.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In response to Office Action herein of December 4, 1937, Paper No. 6, applicants amend their above entitled application as follows:

Cancel Claims 5 and 8.

Remarks

A reconsideration of the claims remaining in this application is respectfully solicited. While it is true that the article referred to by the Examiner from "Textiles and Clothing" suggests that "Allowance can usually be made in some way for shrinkage," there is no clear suggestion as to what method shall be employed in making such allowance. There is absolutely no suggestion in this reference that the shrinkage should be measured in both the direction of the warp and in the direction of the woof, and that the pattern dimensions should be increased in the direction of the woof upon which they are to be placed by a percentage to precompensate for the shrinkage in the direction of the woof, and similarly that the patterns should be increased in the direction of the warp by an amount sufficient
187 to precompensate for the shrinkage in the warp di-

rection. These vital ideas are missing entirely from not only the excerpt from "Textiles and Clothing," but also from the Ainslee et al. patent.

The claims remaining in the application are now each limited to a method in which these specific steps are incorporated, and, since there is no suggestion in any of the art of record that these steps be included in the method of manufacturing an article of clothing, it is believed that the claims define clearly allowable subject matter.

If the Examiner still has any doubt concerning the patentability of the method defined by these claims, it is believed that such doubt should be resolved in favor of the applicants, not only because of the fact that this is the generally accepted rule, but also because of the revolutionary commercial character of this invention, as is fully set forth in the affidavit of Mr. Herbert G. Mayer, filed with the amendment of October 11, 1937. Said amendment, it is believed, sets forth applicants' argument fully and clearly, and such arguments are respectfully incorporated in this amendment by reference, it being hoped that the Examiner will review said arguments and reconsider this application and formally allow it.

Respectfully submitted,

HERBERT G. MAYER
ROBERT SEYFARTH

By WILLIAMS, BRADBURY,
McCALEB & HINKLE
Attorneys

188 Mailed Feb 26 1938

Div. 24 Room 5083 Paper No. 8

Department of Commerce
United States Patent Office
Washington

MOH/LH
February 26, 1938.

Applicant: Herbert G. Mayer et al.
Ser. No. 121,552
Filed January 21, 1937
For Method of Making Clothing

Williams, Bradbury, McCaleb & Hinkle,
2300 Board of Trade Building,
Chicago, Illinois.

The amendment of January 5, 1938, has been incorporated.

Each of the claims is a second time and FINALLY rejected for the reasons fully set forth in the last Office action. It is still believed that to precompensate for the shrinkage of the fabric in both *warp* and *weft* directions is but obvious in view of the teachings of the disclosures of record.

C. O. DURAS
Examiner.

---

189 U. S. Patent Office Mar 17 1938 Div. XXIV.

Mail Division Mar 12 1938 U. S. Patent Office

Board of Appeals Mar 15 1938 U. S. Patent Office

United States Patent Office

Applicants—Herbert G. Mayer and Robert Seyfarth
Invention—Method of Making Clothing
Serial No.—121,552 Filed January 21, 1937

Case 1 Div. 24 Room 5083

2300 Board of Trade Building
Chicago, Ill., March 10, 1938

Hon. Commissioner of Patents
Washington, D. C.
Sir:

Appeal to Board of Appeals

We hereby appeal to the Board of Appeals from the decision of the Principal Examiner in the matter of our application for Letters Patent, Serial No. 121,552, filed January 21, 1937, which, on the 26th day of February, 1938, was rejected the second time. The following are the points of the decision on which the appeal is taken:

(1) The Examiner erred in finally rejecting Claims 1, 2, 3, 4, 6, and 7.

(2) The Examiner erred in not allowing Claims 1, 2, 3, 4, 6, and 7.

An oral hearing is respectfully requested.

Counsel's check to cover the appeal fee of $15.00 is enclosed herewith.

Respectfully,

HERBERT G. MAYER and
ROBERT SEYFARTH

By WILLIAM S. BRADBURY,
McCALEB & HINKLE
Attorneys

DIV. 24

Fig. 1.

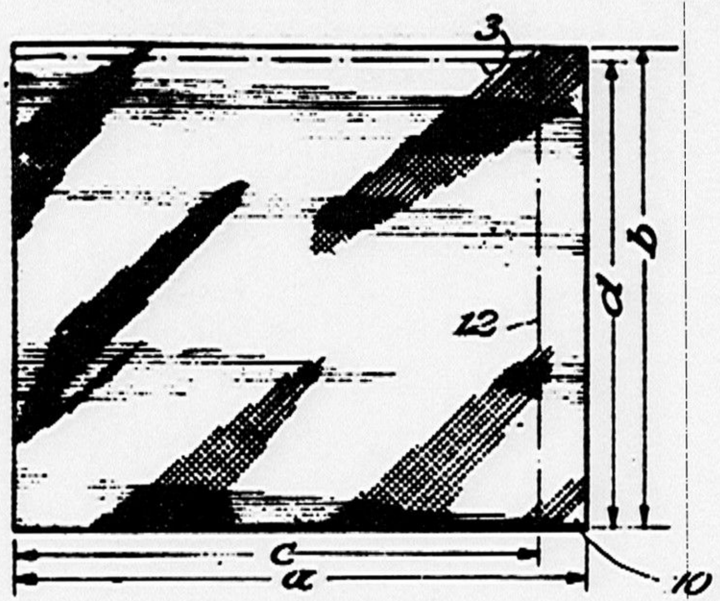


Fig. 2.

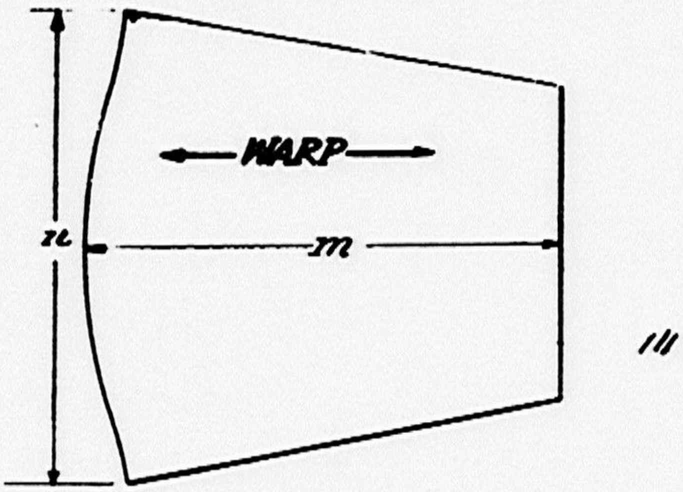
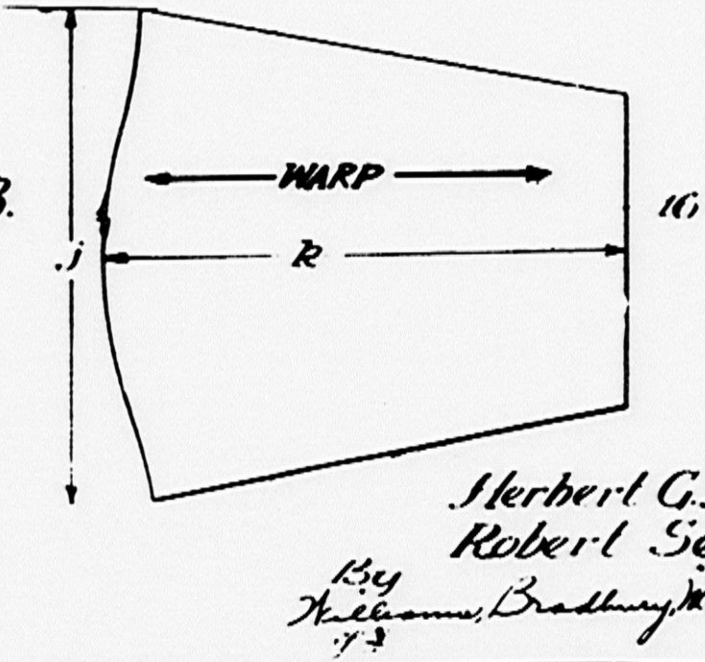


Fig. 3.



Inventors
Herbert G. Mayer
Robert Seyfarth
By
Williams, Bradbury, McCaleb & Hinkle
Attys.

191 Mailed Mar 31 1938

Div. 24 Room 5083 Paper No. 11

Department of Commerce
United States Patent Office
Washington

MOH/LH
March 31, 1938.

Applicant: Herbert G. Mayer et al.
Ser. No. 121,552
Filed January 21, 1937
For Method of Making Clothing

Williams, Bradbury, McCaleb & Hinkle,
2300 Board of Trade Building,
Chicago, Illinois.

The appeal filed March 12, 1938, is informal for the reason that finally rejected claim 9 has neither been included therein nor previously canceled. The appeal will not be forwarded until proper disposition of this claim is made.

A proper response to the final rejection of February 26, 1938, must be filed within six months from that date to save this case from abandonment.

C. O. DURAS,
Examiner.

---

192 Mail Division Apr 4 1938 U. S. Patent Office

U. S. Patent Office Apr 5 1938 Div. XXIV.

United States Patent Office

Applicants: Herbert G. Mayer and Robert Seyfarth
Invention: Method of Making Clothing
Serial No.: 121,552 Filed—January 21, 1937

Case 1 Div. 24 Room 5083

2300 Board of Trade Building
Chicago, April 1, 1938

Hon. Commissioner of Patents
Washington, D. C.

In response to Office Action, Paper No. 11, dated March 31, 1938, applicants amend their above entitled application as follows:

Cancel Claim 9.

Remarks:

It is respectfully requested that the appeal be forwarded now that claim 9 has been canceled.

Respectfully,

HERBERT G. MAYER and
ROBERT SEYFARTH

By WILLIAMS, BRADBURY,
McCALEB & HINKLE

---

193 Mailed Apr 8 1938

MOH/LH Paper No. 13.

The United States Patent Office

Before The Honorable, The Board of Appeals.

In re the application of
Herbert G. Mayer et al.,
Serial No. 121,552,
Filed January 21, 1937,
For: Method of Making Clothing
Williams et al., attorneys.

Examiner's Statement.

This is an appeal taken from the final rejection of claims 1 to 4, inclusive, 6 and 7, the only claims in the case.

The appealed claims read as follows:

1. The method of manufacturing an article of clothing made from a woven fabric which comprises, designing pat-

terns of the various pieces composing the article of clothing, thoroughly wetting a sample of predetermined size of the woven fabric material of which the article is to be made to secure maximum shrinkage thereof, measuring the amount of shrinkage in both the direction of the warp and the direction of the weft, making patterns from those previously designed, in which the dimensions in the direction of the warp are increased by an amount just sufficient to precompensate for shrinkage in the warp direction as determined from said sample of the fabric, and similarly increasing the dimensions of the pattern in the weft direction by an amount just sufficient to precompensate for the shrinkage in the weft direction as determined from the shrinkage of said sample, cutting the pieces of the article from the goods of which the sample was taken using the patterns of increased dimensions, sewing the pieces together to form the article of clothing, thoroughly wetting the article, partially drying the article, pressing the article upon a buck and folding it without stretching it, whereby said article will be of the desired size and shape determined by the patterns originally designed.

194 2. The method of making a sewed article of clothing from a woven fabric material which is capable of shrinking which comprises, completely wetting a sample of each lot of the fabric material, drying said sample without stretching it, measuring the shrinkage of said sample in the direction of the warp threads and perpendicular to said threads, preparing pieces for the article of clothing of dimensions increased from the desired dimensions in the direction of and perpendicular to the warp threads by percentages sufficient to compensate for the shrinkage of the material in its respective dimensions as determined by the shrinkage of said sample, sewing together the pieces to form the article of clothing, thoroughly wetting said article, partially drying said article, and pressing and substantially completely drying said article while the fabric thereof is unstretched.

3. The method of making articles of clothing from woven textile fabrics which comprises, shrinking a sample of the fabric to be used, measuring the shrinkage of the sample in the directions of the warp and woof respectively, cutting the pieces of the article of clothing using patterns the dimensions of which have been increased in one direction by an amount necessary to precompensate for the predetermined shrinkage in the direction of the warp yarn as determined from said sample, and increased in a direction perpendicular to the first named direction by an amount necessary to precompensate for shrinkage in the filler yarn, sewing together the pieces to form the article of clothing, thoroughly wetting the article of clothing to shrink it, and pressing the article while it is free from stretching forces.

4. The method of manufacturing an article of clothing made from a woven fabric in which the thread fibers are constrained in elongated condition by starch or the like, which will be softened and partially removed during wetting and upon removal will permit the thread fibers to contract to their normal condition, thereby causing shrinkage in the article of clothing; which comprises cutting the pieces from the starched fabric, sewing the pieces together to form the article of clothing, thoroughly wetting the sewed article by means of water containing a wetting out agent, and pressing and folding the article substantially without stretching the thread fibers.

6. The method of manufacturing an article of clothing made from a sized fabric material, which after complete wetting will shrink to a predetermined size, which comprises, thoroughly wetting a measured sample of the sized fabric from which the article is to be made, partially drying said sample, pressing said sample to complete the drying thereof without subjecting it to mechanical stretching, again measuring the sample to determine the amount which it has shrunk in both the direction of the warp and in the direction of the filler, making working patterns for the various pieces of the article the warp and filler dimensions of which are greater respectively than those desired in the

pieces of the finished article by an amount exactly sufficient to precompensate for the warp and filler shrinkage as predetermined from the shrinkage of said sample, cutting pieces from the sized fabric using said working patterns, and sewing said pieces together to form the article of clothing.

195 7. The method of making an article of clothing of sized cloth which when thoroughly wetted will shrink substantially, which comprises cutting a sample from the cloth of which the article is to be made, measuring said sample to determine its length *a* in the direction of the warp and its width *b* in the direction of the filler yarn, thoroughly wetting said sample to obtain substantially complete shrinkage thereof, drying said sample without subjecting it to stretching, again measuring said sample to determine its reduced length *c* in the direction of the warp and its reduced width *d* in the direction of the filler, preparing a standard pattern for each piece to be used in the article of clothing, said standard patterns being of exactly the size and shape necessary in the finished article, preparing working patterns for each of the pieces, the working patterns having each dimension in the direction of the warp increased relative to the corresponding dimension of the corresponding standard pattern by the factor a/c and having each dimension in the direction of the filler increased relative to the corresponding dimension of the corresponding standard pattern by the factor b/d, cutting the pieces from the sized cloth from which said sample was cut, using said working patterns as guides, the patterns being properly positioned with reference to the direction of the warp of the cloth, and sewing together the pieces to form the article of clothing.

This application relates to a method of precompensating for shrinkage in clothing. The steps of the method consist, first, in taking a sample of the material of which the garment is to be made and determining therefrom the percentage of shrinkage of the material in the warp and weft directions by subjecting the sample to wetting and drying.

After determining this percentage, the patterns from which the garment parts are to be made are increased in size by this predetermined percentage. The garment is then assembled, wetted, pressed and folded.

The references relied upon are:

Ainslie 1,480,541

Publication entitled "Textile and Clothing", by Watson, page 212.

The only portion of the Ainslie disclosure relied upon is hereinafter quoted. The patent relates to a collar construction and discloses: " . . . the blanks are cut to a larger size, allowing for shrinkage." (page 2, lines 9 and 10).

The publication states, on page 212, lines 9 to 12,
196 inclusive, of the matter under the sub-heading of
"Preparation of Material":

"Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed and measured again to determine the percentage of shrinkage".

Each of the claims was finally rejected on Ainslee and on the disclosure of the publication noted above. It was first held that the claims failed to call for invention over the disclosure of the Ainslee patent quoted above. The use of a sample for determining the exact percentage of shrinkage along the warp and weft, the cutting of the patterns larger by this percentage, and the wetting, drying and pressing of the garment without stretching, were held not to constitute invention. However, attention was directed to the above quotation from the publication "Textiles and Clothing", and it was further held that in view of this teaching it would further not involve invention to employ a *sample to precisely* determine the amount the Ainslee article would shrink. Moreover, the claims were further held unpatentable over the disclosure of the publication alone and accordingly were further rejected thereon. The steps of wetting and pressing without stretching of the garment were not regarded as being material and accordingly failed to contribute patentability. As to determining the amount of shrinkage by a sample along the *warp* and *weft* of the fabric, this is believed to be but an obvious expedient of a skillful and careful worker.

Respectfully submitted,

C. O. DURAS,
Examiner Division 24.

April 8, 1938.

---

197 Paper No. 14

Department of Commerce
United States Patent Office
Washington

26,145
April 19, 1938

Sir:

The case of Herbert G. Mayer and Robert Seyfarth, Serial No. 121,552, will be heard by the Board of Appeals on the 25th day of July, 1938.

The hearings will commence at 9.30 A. M. and as soon as the argument in one case is concluded the succeeding case will be taken up.

If any party, or his attorney, shall not appear when the case is called, his right to an oral hearing will be regarded as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;

Inter partes appeals: Interlocutory and final hearings when no testimony has been taken, thirty minutes each side; final hearing when testimony has been taken, one hour each side.

By special leave, obtained before the argument is commenced, the time may be extended.

The appellant shall have the right to open and conclude in inter partes cases, and in such cases a full and fair opening must be made.

Briefs in inter partes appeals must be filed in accordance with the provisions of Rules 144 and 163, as amended.

Respectfully,

CONWAY P. COE
Commissioner of Patents.

To Messrs. Williams, Bradbury, McCaleb & Hinkle
2300 Board of Trade Bldg.
Chicago, Ill.

198 Mail Division U. S. Patent Office Jul 15 1938
Board of Appeals U. S. Patent Office Jul 15 1938

Case 1 Div. 24 Room 5083

United States Patent Office

Applicants: HERBERT G. MAYER AND ROBERT SEYFARTH
Invention: Method of Making Clothing
Serial No. 121,552 Filed January 21, 1937

Before the Board of Appeals

2300 Board of Trade Building
Chicago, Illinois, July 13, 1938

Hon. Commissioner of Patents
Washington, D. C.

Sir:

It is respectfully requested that the hearing on the Ex Parte Appeal from the decision of the Primary Examiner, now set for July 25, 1938, be postponed until September 12, 1938, since applicants' attorneys have several other appeals set for September 12th and the expense of an additional trip to Washington could be avoided by such postponement of the hearing.

Respectfully submitted,

HERBERT G. MAYER
ROBERT SEYFARTH
By WILLIAMS, BRADBURY,
McCALEB & HINKLE
Attorneys.

Paper No. 16

Department of Commerce
United States Patent Office
Washington

July 16, 1938

Sir:

The case of Herbert G. Mayer and Robert Seyfarth Serial No. 121,552, will be heard by the Board of Appeals on the 12th day of September, 1938

The hearings will commence at 9:30 A. M. and as soon as the argument in one case is concluded the succeeding case will be taken up.

If any party, or his attorney, shall not appear when the case is called, his right to an oral hearing will be regarded as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;

Inter partes appeals: Interlocutory and final hearings when no testimony has been taken, thirty minutes each side; final hearing when testimony has been taken, one hour each side.

By special leave, obtained before the argument is commenced, the time may be extended.

The appellant shall have the right to open and conclude in inter partes cases, and in such cases a full and fair opening must be made.

Briefs in inter partes appeals must be filed in accordance with the provisions of Rules 144 and 163, as amended.

Respectfully,

CONWAY P. COE,
Commissioner of Patents.

To Messrs. Williams, Bradbury, McCaleb & Hinkle, Attys.,
2300 Board of Trade Building,
Chicago, Illinois.

200 Board of Appeals U. S. Patent Office Sep 12 1938

Paper No. 17

Applicants: **Herbert G. Mayer and Robert Seyfarth**
Invention: Method of Making Clothing
Serial No. 121,552 Filed January 21, 1937

Before the Board of Appeals

Brief for Applicants

Applicants' invention relates to a method of manufacturing articles of clothing, and is particularly described in the specifications as a method of manufacturing work shirts, which is the product manufactured by applicants' assignee.

In order to obtain a complete understanding of the nature of applicants' invention, it is necessary briefly to review the processes employed in the manufacture of piece goods. Omitting the preliminary operations, the yarn of cotton fiber is processed and spun. During these operations the individual cotton fibers are intermittently stretched so that in the yarn these fibers which are normally crinkly or wavy are stretched out so as to be more nearly straight. Then, during the final steps of yarn processing, the sizing of starch, tallows, and gums is applied to the yarn, thereby "setting" the individual fibers in their elongated, partially stretched condition. Then, during the weaving operations, the yarn is again placed under tension and the fibers further elongated. During the various bleaching, sizing and
finishing operations of the cloth, the goods is usually
201 processed continuously, being conveyed through the
various steps of washing and bleaching in the manner
of the conveyer belt, thus further stretching and elongating the fibers. In the final sizing, tentering, and calendering operations, these stretched and elongated fibers are covered with a gum, tallow, and starch sizing which holds them in their elongated condition.

Thus, when a manufacturer of clothing buys piece goods from the mill it will be found that the individual fibers of which the thread or yarn of the cloth is composed are stretched and straightened out to a greater or less extent.

However, when the cloth is subjected to a thorough wetting so as to remove the starch, tallow, and gum sizing, the individual fibers tend to reassume their normal original crinkly, kinky or wavy shape, and thus tend to shorten the thread or yarn of which they are composed. This reassumption by the fibers of their crinkly shape is the cause of shrinkage of the cloth.

Applicants have discovered that, possibly due to the fact that during the processes of weaving, bleaching, sizing and finishing, the warp threads are subjected to greater tension than the filler (woof or weft) threads, the shrinkage of most piece goods is much greater in the direction of the warp threads than in the direction of the filler threads.

Of course, shrinkage of piece goods is a well known phenomenon, and in the past even the housewife making a shirt for her husband has taken the possible shrinkage of the goods into consideration. The generally accepted practice, not only among housewives but among manufacturers of articles of clothing, has been to use patterns for a shirt a half size or a size larger than that desired in the finished shirt in order to make some allowance for expected shrinkage of the goods. This haphazard method has been followed
for years, and is the method which is described in the
202 only patent reference cited by the Examiner, the
Ainslie, et al. patent No. 1,480,541. The results of
such haphazard methods have been what were to be expected and what every wearer of ready-made clothing has discovered. Sometimes, when purchasing an article of clothing which the purchaser fears will shrink, he will buy a half size larger than his regular size, and finds upon laundering the article that it has shrunk a full size. At another time he purchases an article a size larger and upon laundering finds it has shrunk only a half size.

Of course, in recent years the better grades of shirts and similar articles of clothing have been made from pre-shrunk piece goods, one such pre-shrinking process being known as the familiar "Sanforized" process. With articles of clothing made of "Sanforized" cloth the shrinkage is very little, and a purchaser has reasonable assurance that the article of clothing which he purchases will fit him after it has been laundred. However, the method of making clothing using pre-shrunk or "Sanforized" piece goods is not entirely satisfactory.

The "Sanforizing" and pre-shrinking processes rely for their effectiveness upon removing a great part of the gum, tallow, and starch sizing from the piece goods prior to the cutting operation. This is necessary since, to shrink the goods, it is essential that substantially all of the sizing be removed from the cloth. The prior removal of the sizing is a distinct disadvantage during the steps of making the article of clothing from the piece goods for a number of reasons. The sizing lends a certain amount of body to the goods so that it may be much more conveniently handled. The sizing also holds the goods flat and prevents wrinkling. During the manufacture of such a simple article of clothing as a work shirt there are approximately forty-two operations. In each of the operations the goods must be handled, fed to machines, etc. When piece goods which has not been
203 pre-shrunk is cut, the sizing tends to hold the threads or yarn together, so that there is no appreciable fraying or unraveling. On the other hand, after the sizing has been removed by some pre-shrinking processes, the threads are not bound together by the gum and starch sizing, and as a result there is a far greater tendency for the goods to unravel during the cutting operations. Furthermore, during the cutting operations it is common practice to cut a large number of pieces during the same operation. The bolts of cloth are laid one upon the other in layers, several inches thick, and the "markers" or patterns are placed on top of these layers of cloth and a motor operated cutting tool is used to cut through all of the layers of goods simultaneously by following the pattern or "marker". During this operation it is very desirable that the goods lie flat. Pre-shrunk goods has a tendency to ruffle or bulge and makes the cutting operation more difficult and time-consuming.

During others of the forty-two operations performed in the manufacture of a work shirt, the goods must be fed through various sewing machines, buttonholing machines, button attaching machines, etc. During all of these operations it is more convenient and an appreciable time saver if the goods being handled has the body and stiffness of sized goods as distinguished from the high degree of flexibility, softness and lack of body characteristic of pre-shrunk goods.

It is in part because of the above difficulties in the manufacture of pre-shrunk and "Sanforized" clothing that the purchaser is obliged to pay a premium for "Sanforized" or pre-shrunk shirts and the like.

In the manufacture of such articles of clothing as work shirts, for example, which retail at prices considerably less than a dollar, it is essential that the cutting, sewing, folding, and others of the forty-two operations performed
204 during the manufacture of the shirt be done easily and rapidly in order to keep the cost of manufacture as low as possible. All of these operations are facilitated in manufacturing shirts in accordance with applicants' improved method, and the cost of production is thus lowered, despite the fact that the quality of the product is greatly improved.

The method of applicants' invention may be described briefly as including the following steps:

(a) Cutting a sample of predetermined size from each lot of piece goods (fully calendered and finished);

(b) Completely wetting each of the samples, preferably using a wetting-out agent, partially drying the sample, preferably using a centrifugal extractor (so as not to stretch the fabric), and completing the drying operation by using a flat pressing buck, which does not stretch the fabric;

(c) Measuring the shrunk sample and thereby determining the percentage of shrinkage in the direction of the warp and also in the direction of the filler threads;

(d) Designing standard patterns which are of exactly the desired size and shape of the pieces of the garment in the finished product after it has been laundered several times;

(e) Constructing working patterns or "markers" from the standard patterns, by increasing the dimensions of the standard patterns in the direction of the warp threads by a factor which is the ratio of the length of the sample in the direction of the warp threads before shrinkage to such length after shrinkage, and similarly increasing the dimensions of the standard pattern in the direction of the filler threads by a factor which was determined by the shrinkage of the sample in the direction of the filler threads;

(f) Marking the "markers" with indicia to indicate the direction, with respect to the warp threads, that the marker should be laid upon the piece goods for the cutting operation;

(g) Cutting the finished piece goods, using the working patterns or markers, carefully observing that the markers are placed upon the piece goods in proper position with respect to the warp threads of the goods;

(h) Sewing garment from the pieces thus cut from the goods;

(i) Shrinking the complete garment, preferably using a wetting agent so as to secure substantially complete removal of the sizing materials;

205 (j) Partially drying the complete garment, preferably by using a centrifugal extractor so as not to stretch the fabric;

(k) Pressing the garment on flat bucks without stretching the fabric, thus completing the drying of the garment;

(l) Folding and packaging the garment, likewise without stretching the fabric.

When the above method of manufacture is employed, a garment or shirt will be produced which is fully shrunk and which will not shrink a measurable amount after repeated launderings.

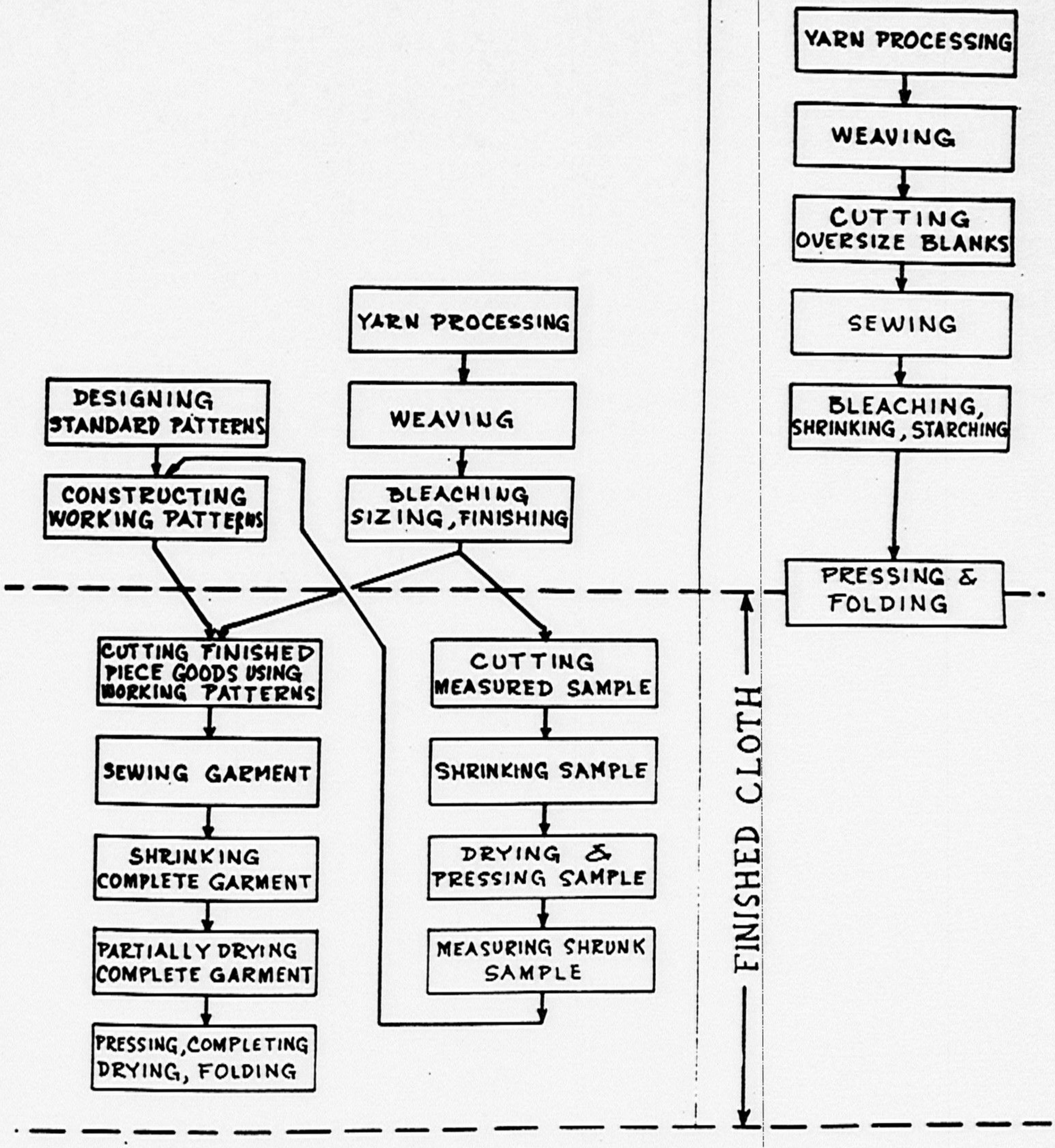
The Process of the Ainslie, et al. Patent Differs Materially from That Invented by Applicants.

The only patent cited by the Examiner during the prosecution of this application was the patent to Ainslie No. 1,480,541, and in his Statement the Examiner has limited his reliance upon this patent to the statement which appears on page 2, lines 9 and 10, that "... the blanks are cut to larger size allowing for shrinkage."

Possibly the reason that the Examiner relies solely upon the above quoted statement of this patent is that other statements in the Ainslie patent are not at all favorable to his position. The patent shows on its face that Ainslie, et al. never had a conception of a process approaching that invented by applicants. They were still following the time-honored method of manufacturing clothing in which they hazarded a guess as to how much the unshrunk goods would shrink and then cut the blanks or pieces for the article of clothing a little larger to allow for expected shrinkage. Applicants, of course, are not the originators of the idea of cutting pieces of a garment from unshrunk goods to a little larger size than desired in a finished and laundered article of clothing. Every seamstress has done this from time immemorial. That Ainslie, et al. followed this time-honored
custom of making the clothing a little larger than
206 ultimately desired is clearly indicated by their statement in their patent, page 2, line 10, et seq.:

"For a 15 collar, the blanks will be cut between 15½ and 15¾ size, preferably about 15¾, as it is preferable to have a finished collar slightly oversize than slightly undersize."

The above statement of Ainslie, et al. shows clearly that their method did not include any steps by which it could be assured that the article would shrink exactly to the desired size. They suggest cutting the collar to size 15½ in order to produce a collar which will be size 15 when shrunk, but they are not quite sure that it will shrink to size 15 and therefore prefer to make a little greater allowance and cut the collar to size 15¾. This is the same method which every seamstress has employed to a greater or lesser extent. What Ainslie, et al. did not appreciate, and which applicants have discovered, is that cloth shrinkage in the direction of the warp and filler threads differs, and that by taking this factor into consideration a garment can be manufactured which may be shrunk exactly to the desired size. On the following page we have reproduced a block outline of the process or method invented by applicants, and also the process of the Ainslie, et al. patent. It will be noted that practically all of the steps of the Ainslie, et al. process are carried out on the unfinished cloth. The Ainslie, et al. invention contemplated working with the so-called "grey goods", that is, unshrunk, unfinished, unsized, uncalendared goods as it comes from the loom. Such goods lacks body, unravels and frays easily and is difficult to handle during the various cutting, sewing, and other operations which must be performed in converting the goods into a garment. Ainslie, et al. contemplated that after the garment was completely sewed, it would then be bleached, shrunk, and sized or starched. In contradistinction to the Ainslie, et al. process, it will be noted from the block diagram that the steps of applicants' process are performed



APPLICANTS' RELYONSIZE PROCESS

PROCESS OF AINSLIE ET AL PATENT

YARN PROCESSING
WEAVING
BLEACHING SIZING, FINISHING
DESIGNING STANDARD PATTERNS
CONSTRUCTING WORKING PATTERNS
CUTTING FINISHED PIECE GOODS USING WORKING PATTERNS
SEWING GARMENT
SHRINKING COMPLETE GARMENT
PARTIALLY DRYING COMPLETE GARMENT
PRESSING, COMPLETING DRYING, FOLDING
CUTTING MEASURED SAMPLE
SHRINKING SAMPLE
DRYING & PRESSING SAMPLE
MEASURING SHRUNK SAMPLE
FINISHED CLOTH
YARN PROCESSING
WEAVING
CUTTING OVERSIZE BLANKS
SEWING
BLEACHING, SHRINKING, STARCHING
PRESSING & FOLDING

208 substantially wholly upon the finished piece goods which, as above pointed out, facilitates handling of the goods during the numerous cutting and sewing operations necessary.

The Ainslie, et al. patent shows nothing more than applicants' readily concede, namely, that the shrinkage of piece goods is inevitable and that some compensation can be made for expected shrinkage by cutting the pieces of which the garment is sewed together, using patterns which are somewhat oversize. The Ainslie, et al. patent contains no other disclosure or even suggestions of the other steps of applicants' improved method.

The Publication "Textiles and Clothing".

The only other reference relied upon by the Examiner is the publication "Textiles and Clothing", by Kate H. Watson, published in 1925 by the American School of Home Economics. This publication states that "allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed, and measured again to determine the percentage of shrinkage."

Any help which a person might obtain from the above quoted statement of this book is in part negatived by the statement which immediately follows the portion which has been quoted. This statement reads:

"Woolen or worsted goods may be shrunk by sponging, either in the store or in the household. A good way to shrink such material is to wring a sheet out of water, then lay the sheet flat, stretch the material on top of it and roll the two together, let them stand overnight, then, laying the wool material on the ironing board, cover with two or three layers of newspaper, then press."

There is no suggestion in the last quoted portion of the reference that the material should be shrunk by soaking it in water in which a wetting-out agent is incorporated. The recommendation that the material should be stretched is, of course, contrary to the best method of securing
209 complete shrinkage, and the statement fails to point

out the necessity of not subjecting the goods to strains during the pressing operation.

However, the major deficiency of this book as a reference is that it fails to point out that there is usually a very substantial difference between the percentage of shrinkage in the direction of the warp threads and the percentage of shrinkage in the direction of the filler threads. Besides not pointing out this fact, there is no suggestion that any care be observed in arranging the patterns on the goods so that they will be cut of a size such that pre-compensation will be made respectively for the shrinkage in both the direction of the warp threads and also to a different extent for the shrinkage in the direction of the filler threads. Thus, although this reference does suggest the idea of determining from a sample of the goods how much shrinkage can be expected, it still fails to teach the reader the fundamental concept of applicants' invention, namely, the idea of taking cognizance of the different amount of shrinkage in the direction of the warp threads and perpendicular thereto, accurately determining the shrinkage in each of these two directions for each lot of piece goods from which the articles of clothing are to be manufactured, making working patterns or markers from standard patterns and having the working patterns designed for being laid upon the goods in a specified direction with respect to the warp threads thereof, as well as having the working patterns of dimensions increased with respect to the standard patterns by different percentages in the warp and filler thread directions.

While this reference contains a hint which might start a reader upon a course which would lead to a discovery of the method invented by applicants, it discloses merely the broad initial step, and does not follow through with a full disclosure of a method which would result in a prac-
210 tical solution of a grave problem in clothing manufacture which has been present and staring the industry in the face for centuries.

The Method of Applicants' Invention Has Proved to be Commercially Practical and Successful.

The method invented by applicants has been commercially adopted by the assignee of this application, the Reliance Manufacturing Company, and has been termed by this company as the "Relyonsize" process. One of the factories of this company has been entirely reorganized to manufacture work shirts in accordance with this improved method. As shown by the affidavit of Mr. Mayer, one of the applicants herein, filed August 11, 1937, Reliance Manufacturing Company makes work shirts which are identical in style and cut, and of identical goods, by three different processes, the first being the traditional process of making the shirt from unshrunk piece goods as it is purchased from the mill, and so cutting the goods that the resulting shirt will be approximately a size larger than the intended size for which it is marked. Thus a purchaser of a shirt made in accordance with this first process, when buying a size "16" shirt, is really buying a size "17" shirt. After several launderings the shirt may have shrunk to size 16-½, or possibly even to size 15-½. The manufacturer does not know to which size the shirt will ultimately shrink; the purchaser has no way of knowing,—both trust and hope that the shirt will ultimately shrink to somewhere near the size marked upon it. The second method of manufacturing shirts employed by Reliance Manufacturing Company is a method in which the piece goods are preshrunk by the so-called "Sanforizing" process. Such shirts do not shrink very much, but there is some shrinkage, and the shrinkage is not uniform and thus
can not be predicted accurately. The shirts made in
211 accordance with this method from the "Sanforized"
piece goods the manufacturer and purchaser have a fair degree of assurance will, after repeated launderings, be quite close to the intended size.

The affidavit of Mr. Mayer shows further that during the last quarter of 1936 Reliance Manufacturing Company commenced manufacturing shirts in accordance with the method of the present application; that although the Reliance Manufacturing Company has been engaged in the business of manufacturing and selling shirts for thirty-nine years, it has never, previous to the making of "Relyonsized" shirts, felt that it could make an offer to replace a shirt if it shrunk, because by the methods of manufacturing shirts which it had used previous to 1936, which included the most common pre-shrinking methods, the amount of shrinkage to be expected could not be accurately predetermined, and there was always more or less shrinkage, and there were numerous complaints for this reason.

The Reliance Manufacturing Company, as shown by said affidavit, had, up to the time of making the affidavit in October, 1937, sold over $104,000.00 worth of "Relyonsized" shirts, each shirt bearing a label guaranteeing replacement of the shirt, without charge, should the shirt shrink, and despite this label on each shirt, there has not been a single complaint from any of the users of the approximately 180,000 shirts sold, nor a single request for a shirt to replace one alleged to have shrunk.

The affidavit of Mr. Mayer also shows that tests were conducted on shirts made in accordance with the method of this application by reliable testing laboratories and that these laboratories were unable to find any measurable amount of shrinkage after repeated launderings.

The affidavit further sets forth that Reliance Manufacturing Company is reorganizing its method of production of
shirts as rapidly as feasible to make it possible to
212 manufacture all of their shirts in accordance with the
method of this application, and that Mr. Mayer expects that eventually all of the shirts produced by it will be manufactured by the method claimed herein.

The affidavit of Mr. Mayer further shows that the demand for "Relyonsized" shirts made in accordance with the method of this application has increased rapidly. Whereas approximately 20 per cent of the *pre-shrunk* shirts sold by Reliance Manufacturing Company during 1937 were manufactured by the "Relyonsized" method, over 50 per cent of the *pre-shrunk* shirts manufactured by said company during August, 1937, were manufactured by this method. Mr. Mayer, the president of Reliance Manufacturing Company, states that in his opinion the advantages of "Relyonsized" shirts, as compared with shirts made by other processes, were the controlling factor which caused customers to purchase such an increased proportion of shirts made by the method claimed herein.

The Prior Art Does Not Anticipate, and Thus The Question Is Whether "Invention" Was Involved.

On the question of what is and what is not "invention", millions of words have been written and many books and articles have been published. There is hardly a decision in a patent case in which there is not some attempt made to apply one or another of the numerous tests of invention. Among the numerous authorities upon the question, there is, however, none which appears to applicants' attorneys so completely and thoroughly to cover the subject as the decision of Judge Hough in *Kurtz, et al.* v. *Belle Hat Lining Co., Inc.*, 280 Fed. 277, and since this decision relates to a patent on an article of clothing, it is believed to be particularly relevant on the discussion of the merits of the present application.

213 In his opinion (page 279), Judge Hough quoted Professor Robinson's dictum that, "The mental faculties involved in the inventive act are creative and not imitative." In the present application, the inventors' acts did not imitate Ainslie, et al. nor any of the other pre-shrinking methods in use, but departed from the beaten path and created an entirely new process, requiring a complete reorganization of the factory in which applicants' assignee manufactures shirts.

Judge Hough then quoted from *General Electric* v. *Sangamo,* 174 Fed. 246, 251, as follows:

"Invention, in the nature of improvements, is the double mental act of discerning, in existing machines or processes or articles, some deficiency, and pointing out the means of overcoming it."

Applicants discerned the deficiency in the pre-shrinking method which was commonly used and is still used by many manufacturers of clothing. This deficiency was that during the operations of manufacturing an article of clothing from pre-shrunk piece goods, the cloth was stretched and strained by the numerous cutting and sewing operations, and as a result, the beneficial effect of the pre-shrinking was partially lost. In addition, pre-shrunk goods frayed more readily and was more difficult to handle than the sized goods. In this application, applicants have clearly pointed out a new process for overcoming this deficiency in the prior art methods and processes.

While Judge Hough appreciated the value of presumptions and inferences implied in attempted definitions of the term "invention", Judge Hough preferred to decide this question "on the evidence".

As one of the factors constituting evidence of invention, Judge Hough quoted the opinion in *Warren, etc. Co.* v. *American, etc. Co.,* 133 Fed. 304, 306, as follows:

214 "* * * 'In determining this question it is proper to bear in mind the condition of the trade as well as the art to which the patent in suit is allied.' "

In the instant case, the invention relates to an old and well developed art, and the affidavit of Mr. Mayer shows that one of the leading manufacturers in this art, the Reliance Manufacturing Company, has never, during the thirty-nine years, it has been engaged in this business, had sufficient confidence in the methods of pre-shrinking which were used to enable it, as it now does, absolutely to guarantee to the customer a new shirt free if it can be shown that a shirt of its manufacture had shrunk.

Judge Hough, in his opinion, continued by stating:

"* * * and similarly that the 'effort (of the court) must always be to view the subject matter from the standpoint of the art concerned.' Kurtz v. Blatt, * * * 263 Fed. 392, 394.''

If it is the duty of a court to view the subject matter from the standpoint of the art concerned, it is believed to be likewise the duty of the Patent Office tribunals similarly to view the subject matter of an invention. In the words of the president of one of the largest manufacturers of work shirts in this country, the present invention ''is, from a commercial point of view, a startling innovaton, and that it presents an exceedingly promising future; and, based upon this belief, the manufacturing methods of Reliance Manufacturing Company are being changed as rapidly as the increasing demand warrants, with the expectation that eventually all shirts produced by it shall be made in accordance with this method.'' (Last paragraph, Mayer affidavit.)

Judge Hough's opinion continues (page 281) with a statement that ''the nature of an invention is usually ascertained from examining the inventive act from which patented matter results; for invention always generates a new idea, although a patentee must create the means, and not merely perceive the end.''

215 In the present case, applicants have not only perceived the end, i. e., the desirability of having a shirt which would be fully pre-shrunk, and could be warranted to be fully pre-shrunk, but they also created the process by which this end could be obtained. Their idea was revolutionary to the shirt manufacturing industry.

Judge Hough next discusses simplicity, cheapness, and utility, as evidence of invention. In the present case, the process is cheaper, especially when the resulting product is compared with that producible by other methods equally costly. As to utility, it is submitted that it is self-evident that a method by which a fully pre-shrunk shirt may be produced has great utility compared with other processes whereby only a partial and unreliable preshrinking is obtained in the finished product. In the sense that applicants' invention utilizes many well known steps in the art of manufacturing clothing, it is an extremely simple process, but as stated by the Supreme Court in *Diamond Rubber Co.* v. *Consolidated Rubber Tire Co.,* 219 U. S. 432, "Its simplicity should not blind us as to its character. Many things, and the patent law abounds in illustrations, seem obvious after they have been done, and 'in the light of the accomplished result' it is often a matter of wonder how they so long 'eluded the search of the discoverer and set at defiance the speculations of inventive genius'."

Judge Hough also cited the case of *Consolidated, etc., Co.* v. *Window Glass Co.,* 261 Fed. 362, 375, wherein, "simplicity alone, though 'cited as evidence of lack of invention, to our minds shows a high order of novelty and invention.' "

Although the steps in applicants' process are relatively simple, their order in the process departs radically from the prior methods of manufacturing clothing, and therefore the relative simplicity of the various steps should be considered not as evidence of lack of invention, but, on 216 the contrary, as evidence of a "high order of novelty and invention".

Upon the subject of commercial success, Judge Hough considered it of questionable safety as a guide, although one which has always "been a powerful piece of evidence, especially when the prior art shows no success along the same lines".

Applicants' attorneys agree with the general statement that commercial success is not always evidence of invention because obviously a device may be commercially successful because of very many other factors than that of novelty or invention. However, in the present case we have peculiarly fortuitous circumstances which show that the commercial success of the process disclosed in this application should be attributed mainly to the inventive character thereof, rather than to other extraneous facts, such as the appearance of the goods, advertising, etc., which sometimes are controlling factors.

In the affidavit of Mr. Mayer it is shown that the Reliance Manufacturing Company makes three kinds of work shirts by three different processes, the resultant shirts being substantially identical in appearance. Thus, any preference by the purchasing public for one kind of shirt over the others must be attributable to the inherent qualities of the shirt resultant from the process by which it was made, rather than to the dress of the goods or the sales effort expended to sell it. Obviously, the Reliance Manufacturing Company is willing and ready to sell each of the three kinds of shirts, depending upon the requisitions of the customer. The affidavit of Mr. Mayer, however, shows that during the short period of eight months which followed the introduction period in the marketing of shirts made according to the "Relyonsized" process of this application, the demand for "Relyonsized" shirts increased by 250 per cent. In other words, while 20 per cent of the preshrunk shirts sold by Reliance Manufacturing Company in January, 1937, were "Relyonsized" shirts, over 50 per cent of the pre-shrunk shirts sold by this company during August, 1937, were made by the "Relyonsized" process. 217

That commercial success, in a proper case, may be considered evidence of invention is borne out by the decision of the Third Circuit Court of Appeals in *Globe Knitting Works* v. *Segal, et al.*, 248 Fed. 495, wherein the court stated:

> "Simple as it may seem, the elastic knit crotch piece produced results desired by those who wear the garment and the payment of large tribute by those who manufacture it. When the question of invention is close, as it usually is when the thing done is simple, the thing achieved, its recognition by the art, and the demand for it by those who use it, are matters properly to be put in the scale and weigh in favor of invention. Neill v. Kinney, 239 Fed. 309, 314, 152 C. C. A. 297. We find the patent valid."

Reverting to the opinion in *Kurtz* v. *Bell Hat Lining Co.*, Judge Hough continued (page 282) the list of facts evidentiary of invention, by including "marked superiority of the article'' and ''a marked improvement in the product''. There can be no doubt whatsoever that applicants' process results in a product which is a marked improvement over similar products manufactured by the prior art methods.

Judge Hough also stated that patentability had often been found '' 'in discovering what is the difficulty with an existing structure' and correcting the same, even though 'the means' are old and their mere 'adaptation to the new purposes involves no patentable novelty.' *Miehle, etc., Co.* v. *Whitlock,* 223 Fed. 647, 650.''

Certainly applicants have been successful in discovering the difficulties of the prior art processes and have succeeded in correcting the same, even though the particular steps of their process may have been old for other purposes.

Judge Hough concluded his discussion of what may be evidence of invention with the statement:

218 > ''Hindsight, or wisdom after the fact, has always been looked upon with disfavor; * * *''

It is rather easy now, with the knowledge of applicants' contribution to the art, to say there was no invention involved in measuring the shrinkage in both the warp direction and the weft direction, and no invention in using a wetting-out agent so as to fully shrink the goods in one operation. It is easy to say that there would be no invention involved in making patterns of increased size in which the increase in dimensions in one direction were different than the percentage of increase of the dimensions in a direction perpendicular thereto. It is easy to say that it is obvious that the cutting and sewing operations can be performed more easily upon the fully sized finished piece goods rather than upon the pre-shrunk material. It is easy now to say that care should be employed in shrinking the sample from which the amount of shrinkage of a lot of piece goods is to be determined, and that when pressing such sample it should be done upon a flat pressing buck so that the material of the sample will not be stretched. It is easy to say now that the markers or patterns should always be laid upon the piece goods in exactly the same manner—with respect to the direction of the warp threads, and that these patterns should bear markings to indicate in which direction they are to be laid upon the goods. It is very easy to say now that if all of these steps are followed, and followed in proper sequence, a fully pre-shrunk garment will be produced, without the attendant disadvantages and difficulties of working upon the flexible, flabby, shrunk piece goods which is so difficult to handle during such of the operations as cutting, sewing, folding, etc.

But how can there be justification for the Examiner's contention that "no invention was involved", when the industry has proceeded for years on the "guess method"
219 of making allowance for expected shrinkage? How can it be said that "no invention was involved" in providing the improved method of this application, when the industry generally adopted one of the less desirable methods of pre-shrinking, the results of which are good but not entirely satisfactory? What reason is there to suppose that any reader of the Ainslie, et al. patent, or the book "Textiles and Clothing", would have discovered that in some lots of piece goods the shrinkage may be in the order of 8 per cent in the direction of the warp, while only 3 per cent in the direction of the filler yarn, while in another lot of nominally the same material the corresponding percentage of shrinkage might be 6 per cent and 5 per cent? How should anyone reading the two references cited by the Examiner discover that to secure substantially complete shrinkage mere wetting of the goods is insufficient, but instead that the wetting must be very complete as results from agitating the goods for a long period of time in water or, as described in this application, agitating the goods in a solution of a wetting agent to facilitate penetration of the water to the interstices between the threads and fibers thereof so as completely to soften, dissolve, and loosen the starch, tallow, and gum sizing incorporated in the cloth?

Where, in the prior art, was a seeker after information as to the best method of manufacuring a fully pre-shrunk garment to conduct his investigations? The references cited by the Examiner certainly do not provide answers to these questions. Applicants were the first to give fully and completely satisfactory replies to these queries, and their ideas constituted a radical innovation in the methods of manufacturing clothing. Their improved method has been found to be highly acceptable from a commercial point of view. The public has confirmed their judgment that a fully pre-shrunk shirt is a desirable article. Their improved method has met with unqualified success. The sanitary advantages of having the washing and pressing operation
220 as a final operation in manufacturing an article of
clothing can not be over-estimated. (All but the most expensive articles of clothing are sold without ever having been washed, not only to save the expense of this operation but also because the sizing lends weight and body to the goods and deludes the purchaser into thinking that the goods of which the garment is made is stronger and heavier than is actually the fact.)

It is respectfully submitted in conclusion that applicants have contributed a meritorious improvement in the method of manufacturing articles of clothing; that the method involves invention over, and is not anticipated by, the prior art; and that the decision of the Examiner should be reversed and the claims on appeal allowed.

Respectfully submitted,

WILLIAMS, BRADBURY, McCALEB
& HINKLE
Attorneys for Herbert G. Mayer and
Robert Seyfarth.

Chicago, Illinois
September 10, 1938.

221 Endorsed: U. S. Patent Office Board of Appeals
Sep 21 1938 Mailed

Appeal No. 26,145 Paper No. 18
Decision

Appeal No. 26,145
Hearing:
September 12, 1938

In the United States Patent Office

Before the Board of Appeals

Ex parte Herbert G. Mayer and Robert Seyfarth

Application for Patent filed January 21, 1937, Serial No. 121,552. Method of Making Clothing.

Messrs. Williams, Bradbury, McCaleb & Hinkle for applicants.

This is an appeal from the final rejection of all the claims remaining in the application, namely, 1 to 4, 6 and 7.

Claim 1 is illustrative.

1. The method of manufacturing an article of clothing made from a woven fabric which comprises, designing patterns of the various pieces composing the article of clothing, thoroughly wetting a sample of predetermined size of the woven fabric material of which the article is to be made to secure maximum shrinkage thereof, measuring the amount of shrinkage in both the direction of the warp and the direction of the weft, making patterns from those previously designed, in which the dimensions in the direction

of the warp are increased by an amount just sufficient to precompensate for shrinkage in the warp direction as determined from said sample of the fabric, and similarly increasing the dimensions of the pattern in the weft direction by an amount just sufficient to precompensate for the shrinkage in the weft direction as determined from the shrinkage of said sample, cutting the pieces of the article from the goods of which the sample was taken using the patterns of increased dimensions, sewing the pieces together to form the article of clothing, thoroughly wetting the article,
222 partially drying the article, pressing the article upon a buck and folding it without stretching it, whereby said article will be of the desired size and shape determined by the patterns originally designed.

The references relied upon by the examiner are as follows:

Ainslie 1,480,541 Jan. 15, 1924

Publication entitled "Textiles and Clothing" by Watson, page 212.

The claims on appeal relate to a method of manufacturing an article of clothing from woven fabric, particularly cotton fabrics. It is pointed out that cotton fabrics commonly sold for manufacture of clothing are given a final stretching treatment which in cooperation with the sizing and sometimes calendering, leaves the individual fibers of cotton in a more straightened condition then that naturally assumed and they are held in such condition by the sizing. Where a garment is made of such relatively extended fabric or in fact any piece of the fabric is wetted or washed and allowed to dry without tension, the cotton fibers tend to assume a more crinkled condition and thus cause shrinkage. It is acknowledged that such shrinkage has long been known as a troublesome feature in connection with garments. Applicants claim a specific method which we believe is sufficiently set forth in the quoted claim for purpose of discussion.

The disclosure in the Ainslie citation is much like that acknowledged by applicants and believed to be a matter of public knowledge and is a disclosure that fabrics may shrink and allowance may be made for shrinking when cutting out the blanks for a garment. The citation "Textiles and Clothing" by Watson is, however, more specific
223 and describes a procedure which is more systematic
and secures more accurate results. That citation suggests that in this relation, "A sample of the material may be measured, then washed, pressed and measured again to determine the percentage of shrinkage".

It may be observed that applicants' process goes further than is specifically set forth in this quoted sentence in that measurement is made both in the direction of warp and in the direction of weft.

Applicants urge that Ainslie's suggestion that where a 15 size collar is to be made, a pattern ½ or ¾ size larger will be employed so that when the finished collar is shrunk it will be approximately 15 or slightly over in size, is only a matter of guesswork and cannot produce the exact results of their method in that the determination of exact degree of shrinkage of the particular cloth is not suggested. It is urged in respect to the citation "Textiles and Clothing" that it suggests application of the method to woven and worsted goods rather than to cotton and that it does not appreciate that there is a difference in percentage of shrinkage as between warp and weft thread directions.

First in regard to the question of anticipation in measuring in two directions, it is our view that Ainslie's suggestion of a pattern having an over-all excess in size of from ½ to ¾ takes account of all directions. We hold that the suggestion in "Textiles and Clothing" of measuring the sample obviously means any number of directions de-
224 sired. It is further our view that it is a matter of
public knowledge at least among dressmakers that cloth may shrink in more than one direction. It is considered immaterial whether the cloth is cotton, wool or worsted

goods, so far as the principle involved in this process is concerned. The claims are directed to any woven fabric.

We have given careful consideration to the brief including the discussion of and showing as to commercial success but are not convinced that patentability is presented by the process set forth in the appealed claims.

The decision of the examiner is affirmed.

BOARD OF APPEALS

W L REDROW
Examiner-in-Chief
W. L. THURBER
Examiner-in-Chief
F P EDINBURG
Examiner-in-Chief

September 21, 1938

Messrs. Williams, Bradbury, McCaleb & Hinkle,
2300 Board of Trade Bldg.,
Chicago, Ill.

225 Endorsed: Mail Division Oct 21 1938 U. S. Patent Office

Endorsed: Board of Appeals Oct 21 1938 U. S. Patent Office

United States Patent Office

Applicants: Herbert G. Mayer and Robert Seyfarth
Invention: Method of Making Clothing
Serial No. 121,552
Filed January 2, 1937

Before the Board of Appeals

Petition for Rehearing

Applicants respectfully petition the Board of Appeals for a rehearing of the appeal in the above entitled application, decided by the Board of Appeals on September 21, 1938.

The grounds for this petition are as follows:

1. Due possibly to the form of the claims, the Board erroneously concluded that it is immaterial with respect to the principle of applicants' process whether the cloth is cotton, wool, or worsted goods. Applicants therefore request that the Board recommend allowance of the claims when amended to limit them as applied to cotton goods.

2. The Board erroneously assumed that the publication, "Textiles and Clothing," teaches the idea that different allowances should be made in the patterns for shrinkage in the direction of the warp and filler threads respectively.

3. For the first time in history, a method of manufacturing clothing has been provided by applicants whereby an article of clothing fully and exactly shrunk to size may be produced.

226

I.

The shrinkage in cotton piece goods is of an entirely different nature than the shrinkage of woolen and worsted fabrics. Due apparently to their animal origin, wool fibers do not shrink uniformly, and maximum shrinkage cannot be obtained by one or even several launderings. There is no practically definite limit to the amount of shrinkage which may take place in a piece of woolen goods. The specification of this application is directed solely to cotton goods. Applicants therefore respectfully request that the Board recommend the allowance of the claims of this application if they are amended to limit the process to one carried out on cotton fabrics, the amendments to be specifically as follows:

In claims 1 to 4, inclusive, line 2 in each instance, after "woven" insert —cotton—.

In claim 6, line 2, after "sized" insert —cotton—.
In claim 7, line 1, after "sized" insert —cotton—.

II.

The publication, "Textiles and Clothing," suggests merely that the percentage of shrinkage may be determined, but does not suggest that the shrinkage in both directions be determined, nor does it teach that by taking into consideration the difference in shrinkage in the directions of the warp and the filler yarn complete and exact allowance could be made so that the resulting article of clothing produced would be fully preshrunk exactly to size. Even though it be conceded that it was well-known that cotton piece goods shrinks different percentages in the direction of the warp and filler threads, there is no suggestion in this publication (or other references of record) to indicate how this knowledge could be utilized in a practical way.

III.

As shown by the record, applicants were the first to provide a method by which clothing fully preshrunk to the exact size desired could be manufactured. In an old art, such as that of clothing manufacture, it is believed that the novelty of the method and the character of the results obtained should be the criterion of patentability, rather than whether there was present in devising the improvement that indefinable, philosophical and psychological act of "invention".

Smith vs. Goodyear, etc., 93 U. S. 486.
Potts vs. Creager, 155 U. S. 597.
Hobbs vs. Beach, 180 U. S. 674.
Loom Co. vs. Higgins, 105 U. S. 580.
Keystone vs. Adams, 151 U. S. 139.
The Barbed Wire Patent, 143 U. S. 275.

Applicants have proceeded exactly contrary to the teachings of the art cited, for in the publication, "Textiles and Clothing", it is stated, "Wash materials which will be worn a good many times before washing should not be shrunk, as wetting removes, or disturbs the filling, and they will then muss or soil more easily." Exactly contrary to this precept, applicants' fully shrink the article of clothing before it is sold.

It is respectfully requested that a rehearing be granted for the purpose of presenting the above points in greater detail.

Respectfully submitted,

WILLIAMS, BRADBURY, McCALEB & HINKLE
Attorneys for Herbert G. Mayer and Robert Seyfarth.

228 Endorsed: U. S. Patent Office Board of Appeals Oct 26 1938 Mailed

Appeal No. 26,145 Paper No. 20

Appeal No. 26,145

Decision

In the United States Patent Office

Before the Board of Appeals

Ex parte Herbert G. Mayer and Robert Seyfarth

Application for Patent filed January 21, 1937, Serial No. 121,552. Method of Making Clothing.

Messrs. Williams, Bradbury, McCaleb & Hinkle for applicants.

On Petition for Rehearing

It is requested that we approve a proposed amendment limiting each claim to cotton fabrics and then consider the matter of patentability over the state of the art.

We find no reason in this case for variation from the practice indicated by Ex Parte Moore, 1923 C. D. 13 and must deny the request.

No reason is found for changing our conclusions in respect to other features.

The petition is denied.

W L REDROW
Examiner-in-Chief
W. L. THURBER
Examiner-in-Chief
F. P. EDINBURG
Examiner-in-Chief
Board of Appeals

MESSRS. WILLIAMS, BRADBURY,
McCALEB & HINKLE,
2300 Board of Trade Bldg.,
Chicago, Ill.

October 26, 1938

---

229 Department of Commerce

United States Patent Office
Washington

Ex parte Herbert G. Mayer and Robert Seyfarth,
Serial No. 121,552,
Filed January 21, 1937,
Method of Making Clothing.

Notice of Civil Action Under Section 4915 R. S.

A civil action under Section 4915 R. S., entitled Robert Seyfarth v. Conway P. Coe, Commissioner of Patents, Civil Action No. 2079, involving this application, was filed on March 18, 1939, in the District Court of the United States for the District of Columbia.

R. F. WHITEHEAD
Solicitor.

March 18, 1939.

230 Endorsed: Mail Division Mar 4 1940 U. S. Patent Office

Endorsed: U. S. Patent Office Mar 5 - 1940 Div. XXIV.

United States Patent Office

Case 1 Div. 24 Room 5083

Applicant H. Mayer & R. Seyfarth
Invention Method of Making Clothing
Serial No.: 121,552

Filed: Jan. 21, 1937

Substitute Power of Attorney

Hon. Commissioner of Patents
Washington, D. C.

Sir:

In the matter of the above-entitled application, the undersigned attorneys of record hereby revoke their own former power of attorney in said application and appoint the firm of Williams, Bradbury & Hinkle (Reg. No. 14,893), a copartnership composed of Lynn A. Williams, Clifford C. Bradbury, Ross O. Hinkle, Albin C. Ahlberg, Elwood Hansmann, Warren C. Horton, and Benjamin F. Wupper, of 2300 Board of Trade Building, Chicago, Illinois, as attorneys with full power of revocation and substitution, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Signed at Chicago, Illinois, this 29th day of February, 1940.

WILLIAMS, BRADBURY, McCALEB & HINKLE
Attorneys of record

11/21/37
1/19/39

1937

CONTENTS

1. Application papers.
2. [illegible] June 16 1937
3. Rej - Aug. 10 1937
4. Amend. A [illegible] 11-1937
5. Amend. B Oct. 16 - 1937
6. Rej - Dec. 4, 1937
7. Amend. C. Jan 5-1938
8. FINAL Rej - Feb. 26, 1938
9. Appeal to Board Mar 12 1938
10. [illegible] Mar 19 - 1938
11. Letter - Mar. 31, 1938
12. Amend. D Apr 4 1938
13. Exr's Statement - Apr. 8, 1938
14. Hearing July 26-1938
15. REQUEST TO POSTPONE HEARING July 15 1938
16. Hearing postponed to Sept. 19 1938
17. BRIEF SEP 12 1938
18. DECISION BY BOARD SEP 21 1938
19. Petition for Rehearing Oct 24/38
20. DECISION BY BOARD OCT 26 1938
21. Notice of final action under Sec. 4915 R.S. - March 18/39
22. Sub. Power of atty [illegible]
23.
24. Not up for action
25. Do not hold abandoned

24136

121552

40

114 *Memorandum*

The Defendant's Exhibits, listed below, are the same as the Plaintiff's Exhibits, as follows:

Exhibit A—Same as Plaintiff's Exhibit No. 2
Exhibit A′—Same as Plaintiff's Exhibit No. 4
Exhibit B—Same as Plaintiff's Exhibit No. 3
Exhibit C—Included in Plaintiff's Exhibit No. 1

Exhibit D—Examiner's statement made on appeal, included in Plaintiff's Exhibit No. 1

Exhibit E—Decision of the Board of Appeals, included in Plaintiff's Exhibit No. 1

Exhibit F—Decision of the Board of Appeals on petition for rehearing, included in Plaintiff's Exhibit No. 1

JAMES H. LITTLEHALES
Solicitor for Plaintiff
867 National Press Building

115 *Proposed Findings of Fact*

1. This is an action under Section 4915 R. S. (U. S. C., Title 35, Sec. 63) in which plaintiff seeks a judgment authorizing the Commissioner of Patents to issue to plaintiff a patent on the application of Herbert G. Mayer and Robert Seyfarth, Serial No. 121,552, which was filed in the Patent Office on January 21, 1937. Claims 1, 2, 3, 4, 6 and 7 of the application are involved.

2. A cotton fiber in its natural condition, as when removed from the cotton plant, is of wavy or corkscrew-like shape. When tension is applied to such fiber, it becomes straightened out, and hence elongated. In the manufacture of cotton yarn, the individual cotton fibers are repeatedly placed under tension, as during the roving, spinning, and weaving operations, and the fibers are held in their straightened elongated condition by the sizing. In finishing cotton piece goods, sizing, in the form of starches, tallow and the like, is applied to the goods, and when the goods is calendered, this sizing acts like glue to hold the cotton fibers in their straightened out condition and to hold the yarns

116 in their proper relative positions. The sizing in the piece goods adds body to it, making the goods easier to handle, improving the appearance of the goods, and making the goods less liable to raveling.

3. When the sizing of finished cotton piece goods is removed or sufficiently softened, the individual cotton fibers are freed, and they resume their natural wavy or corkscrew-like shape. In doing so, the fibers shorten and this contraction of the fibers into the wavy or corkscrew-like shape results in what is known as shrinkage of the fabric.

4. As many as four or more ordinary laundry or washing operations are required to secure complete shrinkage of cotton garments, and when a garment is completely thus shrunk by washing or laundering, the fabric lacks sheen, luster, and the body of new goods, so that a garment in this condition is not readily salable as a new garment.

5. The Mayer and Seyfarth application relates to a method of making garments such as cotton shirts. The object of the method is to make a garment which, when finished and ready for sale, will be of exactly the required size and will have a smooth full body finish, as is characteristic of new cloth, and will not thereafter shrink even though laundered repeatedly. The method as claimed includes the following steps: Measuring and completely shrinking a sample of the cloth to ascertain the maximum shrinkage in both warp and weft directions, preferably by the use of a wetting-out agent, making the garment from unshrunk finished goods by using patterns made just sufficiently oversize in both the warp and weft directions exactly to compensate for the expected shrinkage in the warp and weft directions respectively, as determined by the testing of the sample, thoroughly wetting the garment in a way effective to secure maximum possible shrinkage, preferably using a wetting-out agent, and finally pressing the garment without stretching the fabric.

117 6. The process invented by Mayer and Seyfarth has been and is in commercial use by Reliance Manu-

facturing Company, the process being known as the "Relyonsize" process.

7. In the process of manufacturing garments, the fabric has a large number of operations performed upon it, and in most of these operations, tension is unavoidably applied to the fabric. Plaintiff's Exhibits 9, 10, and 11 exemplify portions of machines to which the fabric is fed by the machine operator under tension sufficient to cause stretching. For most efficient operation of these machines, it is necessary that the fabric being handled contain the usual sizing.

8. Plaintiff's Exhibit 6A is a yard square of covert cloth with hemmed ends in its original condition as received from the mill and as used by Reliance Manufacturing Company for the manufacture of work shirts. Plaintiff's Exhibit 6B, originally identical with Plaintiff's Exhibit 6A, is fully shrunk by thoroughly wetting with water containing a wetting-out agent, and pressing without stretching. These exhibits show that covert cloth may shrink as much as 12.9% in the direction of the warp, and as much as 3.5% in the weft direction.

9. Plaintiff's Exhibits 7A and 7B are samples of chambray cloth, cut from the same bolt and originally of the same dimensions, from which Reliance Manufacturing Company manufactures work shirts, Exhibit 7A being unshrunk and Exhibit 7B having been shrunk by thoroughly wetting with water containing a wetting-out agent, and pressing without stretching. These exhibits show that this chambray cloth shrinks 11.1% in the direction of the warp and approximately 2.1% in the direction of the weft.

10. Plaintiff's Exhibit 8A exemplifies a work short manufactured by Reliance Manufacturing Company, in the condition in which it is just prior to the thorough wetting, using the wetting-out agent, of the Relyonsize process. Plaintiff's Exhibit 8B exemplifies a shirt otherwise identical with Plaintiff's Exhibit 8A which has been subjected to the complete Relyonsize process.

118 11. The thorough wetting by the use of a wetting-out agent in applicants' Relyonsize process, results

in complete shrinkage of the fabric within two or three minutes, whereas, in garments made by other methods complete shrinkage of the fabric is not obtained until it has been subjected to several, as many as five or six, ordinary washing or laundering operations.

12. Shirts manufactured in accordance with the Relyonsize process of the Mayer and Seyfarth application do not change in dimensions as a result of wear or laundering.

13. By no known process other than that disclosed in the Mayer and Seyfarth application is it possible to produce a garment shrunk to its maximum extent and containing a large proportion of the original sizing by which the appearance, "feel", and wearing qualities of new goods is retained.

14. There is not on the market in the United States a cotton thread which has been shrunk.

15. The patents to Cluett Nos. 1,861,423 and 1,944,001 disclose the principles of and apparatus for a preshrinking process known as the "Sanforizing" process. In this process, a sample of the goods to be treated is laundered repeatedly until it is completely shrunk and the shrinkage in the warp and weft directions determined. Using the information determined from the shrinkage of the sample, the piece goods is crinkled so as to assume a condition analogous to that of crepe paper. The extent of the crinkling is such as to reduce the goods approximately to the size to which the goods would shrink. This crinkling is accomplished in both the direction of the warp and the direction of the weft. In the course of this crinkling operation, the goods is moistened and the individual yarns of which the goods is composed are partly freed from the binding action of the sizing prior to the crinkling, and the sizing is again set by heat while the yarns are held in this crinkled condition.

119 16. The Sanforizing process is a commercially successful and useful process, but does not produce true shrinkage of the goods. Instead, the Sanforizing process produces a mechanical crinkle which reduces the dimen-

sions of the goods by an amount comparable to that produced by true shrinkage.

17. In the manufacture of garments using piece goods which has been Sanforized, the goods is unavoidably stretched due to the tension which must be placed upon it during various manufacturing operations, and as a result, the benefits of the Sanforizing process are partially lost. A finished garment made of Sanforized piece goods will ultimately shrink more than Sanforized piece goods subjected to the same laundering operations.

18. The various operations necessary in the manufacture of garments such as shirts, may be more easily performed at lower cost when the fabric operated upon is in the condition in which it is received from the cloth finishing mill and in which it contains the usual sizing, than when it has been subjected to the Sanforizing process.

19. The crinkled goods resulting from the Sanforizing process of the Cluett patents Nos. 1,861,423 and 1,944,001, will increase in size after initial laundering and may increase in size after the second and possibly the third laundering operations. Thereafter, upon subsequent laundering operations, the goods will shrink until complete shrinkage is obtained. The first laundering results in the removal of the crinkle produced by the Sanforizing process and the increase in size is due to the removal of this crinkle and due to the fact that only partial shrinkage will take place during the initial laundering operation.

20. It is not possible, by the use of the Sanforizing process of Cluett patents 1,861,423 and 1,944,001, to produce a garment which will retain its given size upon being laundered.

120 21. The patent to Ainslie No. 1,480,541 discloses a method of making articles, such as collars, cuffs, shirts, shirt bosoms, etc., in which method the unbleached, unsized, and unshrunk goods is cut into blanks which are made somewhat oversize to make a rough allowance for shrinkage. The blanks, e. g. for a collar, are then sewed together to make the collar, and thereafter bleached. The

bleach is then washed out and the collar laundered, being only partially shrunk incidental to the bleaching and laundering operations. The patentees advise that for a size 15 collar, the blanks should be cut between 15½ and 15¾ size, as it is preferable to have a finished collar slightly oversize rather than slightly undersize. The patentees do not specify how the article is to be pressed, and if this is done by the customary commercial methods, the laundered article will be stretched so that it will later shrink considerably during subsequent laundering operations.

22. In the process of the Ainslie et al. patent No. 1,480,541 the cutting and sewing operations are performed upon unfinished gray goods.

23. The process of the Ainslie et al. patent No. 1,480,541 could not be employed in the manufacture of colored or printed shirts since it would be impossible to print the colors on the finished garment.

24. Complete shrinkage of the goods is not obtained by the process disclosed in the Ainslie et al. patent. As a result, further shrinkage will take place upon subsequent laundering of the collar or other article produced by this process.

25. The Ainslie et al. patent does not disclose a method by which a garment of precisely the desired dimensions could be produced.

121 26. The text book "Textiles and Clothing," by Watson, published in Chicago in 1925 by American School of Home Economics, contains the following disclosure in connection with instructions for making garments:

"Shrinking of material before making is desirable in wash goods which will be laundered soon. Wash materials which will be worn a good many times before washing should not be shrunk, as wetting removes or disturbs the finish, and they will then muss or soil more easily. Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed and measured again to determine the percentage of shrinkage."

27. The text book "Textiles and Clothing" suggests two alternative methods of making clothing. By the first method the cutting and sewing operations are necessarily performed upon the goods in the sleazy condition which it assumes after removal of at least a part of the sizing. By the second method the garment produced is initially oversize and will not shrink to the desired size until after it has been laundered. If the sample is washed but once, as prescribed, complete shrinkage will not be obtained, and, as a result, the garment, after having been laundered several times, will shrink more than the amount for which allowance was made.

28. The methods of making clothing suggested in the text book "Textiles and Clothing" are not economically or practically usable in quantity production of shirts, where many thousands of shirts are manufactured in one lot.

29. It is admitted by plaintiff that it has long been the practice of housewives, in making garments from shrinkable goods, to make the garments larger than the desired size, in order to allow for subsequent shrinkage.

122 30. The Reliance Manufacturing Company adopted the Relyonsize process for the manufacture of shirts in 1936. In 1937 it sold 226,000 shirts manufactured by this process. In 1938, it sold 383,931 shirts, and in 1939, it sold 509,000 shirts manufactured by the Relyonsize process.

31. Shirts manufactured by the Relyonsize process of the Mayer and Seyfarth application are sold with a guarantee that the purchaser may secure a new shirt free if the Relyonsized shirt shrinks. No purchasers of Relyonsized shirts have ever returned Relyonsize shirts claiming they had shrunk.

32. The Reliance Manufacturing Company sells shirts manufactured in accordance with the Relyonsize process disclosed in the Mayer and Seyfarth application at a price 75¢ per dozen more than its price for otherwise identical shirts which have not been manufactured by this process.

33. The Relyonsize process may be used in the manufacture of garments from colored or printed fabrics. The Relyonsize process does not affect the dye in fabrics. A garment produced by the Relyonsize process retains the original finish, color, and body of the finished piece goods from which it was made.

123 *Conclusions of Law*

1. Nothing amounting to invention over what was previously known is recited in the claims here involved.

2. The claims in suit are unpatentable.

3. Plaintiff is not entitled to a patent containing any of the claims in suit.

4. The complaint should be dismissed.

....

Justice.

November , 1940.

The foregoing proposed findings of fact are submitted by plaintiff as setting forth uncontroverted facts appearing from the evidence adduced at the trial of this cause.

ROBERT SEYFARTH
By WILLIAMS, BRADBURY & HINKLE
Attorneys

LYNN C. WILLIAMS
JAMES H LITTLEHALES
Of Counsel
867 National Press Building
Attorney for Plaintiff.

124 **Findings of Fact.**

1. This is an action under Section 4915 R. S. (U. S. C., title 35, sec. 63) in which plaintiff seeks a judgment authorizing the Commissioner of Patents to issue to plaintiff a patent on the application of Herbert G. Mayer and Robert Seyfarth, Serial No. 121,552, which was filed in the Patent

Office on January 21, 1937. Claims 1, 2, 3, 4, 6 and 7 of the application are involved.

2. A cotton fiber in its natural condition, as when removed from the cotton plant, is of wavy or corkscrew-like shape. When tension is applied to such fiber, it becomes straightened out, and hence elongated. In the manufacture of cotton yarn, the individual cotton fibers are repeatedly placed under tension, as during the roving, spinning, and weaving operations, and the fibers are held in their straightened elongated condition by the sizing. In finishing cotton piece goods, sizing, in the form of starches, tallow, and the like, is applied to the goods, and when the goods is calendered, this sizing acts like glue to hold the cotton
125 fibers in their straightened out condition and to hold the yarns in their proper relative positions. The sizing in the piece goods adds body to it, making the goods easier to handle, improving the appearance of the goods, and making the goods less liable to raveling.

3. When the sizing of finished cotton piece goods is removed or sufficiently softened, the individual cotton fibers are freed, and they resume their natural wavy or corkscrew-like shape. In doing so, the fibers shorten and this contraction of the fibers into the wavy or corkscrew-like shape results in what is known as shrinkage of the fabric.

4. As many as four or more ordinary laundry or washing operations are required to secure a complete shrinkage of cotton garments, and when a garment is completely thus shrunk by washing or laundering, the fabric lacks sheen, luster, and the body of new goods, so that a garment in this condition is not readily salable as a new garment.

5. The Mayer and Seyfarth application relates to a method of making garments such as cotton shirts. The object of the method is to make a garment which, when finished and ready for sale, will be of exactly the required size and will have a smooth full body finish, as is characteristic of new cloth, and will not thereafter shrink even though laundered repeatedly. The method as defined in most of the claims includes the following steps: Measuring and

completely shrinking a sample of the cloth to ascertain the maximum shrinkage in both warp and weft directions,
126 (according to the specification, preferably by the use of a wetting-out agent), making the garment from unshrunk finished goods by using patterns made just sufficiently oversize in both the warp and weft directions exactly to compensate for the expected shrinkage in the warp and weft directions respectively, as determined by the testing of the sample, thoroughly wetting the garment in a way effective to secure maximum possible shrinkage, (preferably, according to the specification, and according to claim 4, using a wetting-out agent) and finally pressing the garment without stretching the fabric.

6. The process disclosed by Mayer and Seyfarth has been and is in commercial use by Reliance Manufacturing Company, the process being known as the "Relyonsize" process.

7. In the process of manufacturing garments, the fabric has a large number of operations performed upon it, and in most of these operations, tension is unavoidably applied to the fabric. Plaintiff's Exhibits 9, 10, and 11 exemplify portions of machines to which the fabric is fed by the machine operator under tension sufficient to cause stretching. For most efficient operation of these machines, it is necessary that the fabric being handled contain the usual sizing.

8. Plaintiff's Exhibit 6A is a yard square of covert cloth with hemmed ends in its original condition as received from the mill and as used by Reliance Manufacturing Company for the manufacture of work shirts. Plaintiff's Exhibit 6B, originally identical with Plaintiff's Exhibit 6A, is fully shrunk by thoroughly wetting with water containing a wetting-out agent, and pressing without stretching. These exhibits show that covert cloth may shrink as much as
127 12.9% in the direction of the warp, and as much as 3.5% in the weft direction.

9. Plaintiff's Exhibits 7A and 7B are samples of chambray cloth, cut from the same bolt and originally of the same dimensions, from which Reliance Manufacturing Company manufactures work shirts, Exhibit 7A being unshrunk

and Exhibit 7B having been shrunk by thoroughly wetting with water containing a wetting-out agent, and pressing without stretching. These exhibits show that this chambray cloth shrinks 11.1% in the direction of the warp and approximately 2.1% in the direction of the weft.

10. Plaintiff's Exhibit 8A exemplifies a work shirt manufactured by Reliance Manufacturing Company, in the condition in which it is just prior to the thorough wetting, using the wetting-out agent, of the Relyonsize process. Plaintiff's Exhibit 8B exemplifies a shirt otherwise identical with Plaintiff's Exhibit 8A which has been subjected to the complete Relyonsize process.

11. The thorough wetting of cotton fabric by the use of a wetting-out agent, such as naphthalene sulphonic acid derivative, in applicants' Relyonsize process, results in complete shrinkage of the fabric within two or three minutes, whereas in garments made by other methods complete shrinkage of the fabric is not obtained by laundering until it has been subjected to several, as many as five or six, ordinary washing or laundering operations.

12. The patents to Cluett Nos. 1,861,423 and 1,944,001 disclose the principles of and apparatus for a preshrinking process known as the "Sanforizing" process. In
128 this process, a sample of the goods to be treated is laundered repeatedly until it is completely shrunk and the shrinkage in the warp and weft directions determined. Using the information determined from the shrinkage of the sample, the piece goods is subjected to an operation which crinkles the yarns. The extent of the crinkling is such as to reduce the goods approximately to the size to which the goods would shrink. This crinkling is accomplished in both the direction of the warp and the direction of the weft. In the course of this crinkling operation, the goods is moistened and the individual yarns of which the goods is composed are partly freed from the binding action of the sizing prior to the crinkling, and the sizing is again set by heat while the yarns are held in this crinkled condition.

13. The Sanforizing process is a commercially successful and useful process, but does not produce natural shrinkage of the goods. Instead, the Sanforizing process produces a mechanical crinkle of the yarns which reduces the dimensions of the goods by an amount comparable to that produced by natural shrinkage.

14. The crinkled goods resulting from the Sanforizing process of the Cluett patents Nos. 1,861,423 and 1,944,001, will increase in size after initial laundering and may increase in size after the second and possibly the third laundering operations. Thereafter, upon subsequent laundering operations, the goods will shrink until complete shrinkage is obtained. The first laundering results in the removal of the crinkle produced by the Sanforizing process and the increase in size is due to the removal of this crinkle and due to the fact that only partial shrinkage will take place
129 during the initial laundering operation.

15. It is not possible, by the use of the Sanforizing process of Cluett patents 1,861,423 and 1,944,001, to produce a garment which will retain its given size upon being initially laundered. For the same reason that a Sanforized garment will increase in size on being laundered for the first time, plaintiff's shirts will also. In both, the fibres are held in crinkled condition by the sizing. This is only partially washed out in the initial laundering. In the usual ironing the fibres are straightened out to some extent and are held so by the sizing material remaining in the goods. There appears to be no material difference between a shirt made of Sanforized cloth and the shirt made by plaintiff.

16. The patent to Ainslie, No. 1,480,541, discloses a method of making garments such as collars, cuffs, shirts, shirt-bosoms, etc., in which method the cloth in unbleached and unshrunk condition is cut into blanks which are made over-size the proper amount to allow for subsequent shrinkage, and the blanks are then sewed together to make the garment. Thereafter the garment is bleached and shrunk with the result that a garment of the required size is produced.

17. In the process of the Ainslie et al. patent No. 1,481,541, the cutting and sewing operations are performed upon unfinished gray goods.

18. The text book "Textiles and Clothing," by Watson, published in Chicago in 1925 by American School of Home Economics, contains the following disclosure in connection with instructions for making garments:

130 Shrinking of material before making is desirable in wash goods which will be laundered soon. Wash materials which will be worn a good many times before washing should not be shrunk, as wetting removes or disturbs the finish, and they will then muss or soil more easily. Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed and measured again to determine the percentage of shrinkage.

19. It was and is stipulated that it has long been the practice for housewives, in making garments from shrinkable goods, to make the garments larger than the desired size, in order to allow for subsequent shrinkage.

20. The Reliance Manufacturing Company adopted the Relyonsize process for the manufacture of shirts in 1936. In 1937 it sold 226,000 shirts manufactured by this process. In 1938, it sold 383,931, and in 1939, it sold 509,000 shirts manufactured by the Relyonsize process.

21. Shirts manufactured by the Relyonsize process of the Mayer and Seyfarth application are sold with a guarantee that the purchaser may secure a new shirt free if the Relyonsized shirt shrinks. No purchasers of Relyonsized shirts have ever returned Relyonsized shirts claiming they had shrunk.

22. The Reliance Manufacturing Company sells shirts manufactured in accordance with the Relyonsize process disclosed in the Mayer and Seyfarth application at a price 75¢ per dozen more than its price for otherwise identical shirts which have not been manufactured by this process.

23. The Relyonsize process may be used in the manufacture of garments from colored or printed fabrics. The

Relyonsize process does not affect the dye in fabrics. A garment produced by the Relyonsize process retains the original finish, color, and body of the finished piece
131 goods from which it was made. The same is true of the process disclosed in the Cluett patent No. 1,861,423 and the process disclosed in the textbook "Textiles and Clothing".

24. It is admittedly old to use a wetting-out agent on goods to soften the sizing contained in the goods. The softening of the sizing causes shrinkage of the goods.

Conclusions of Law.

1. All of the method steps set forth in the claims here involved are either old and well known or are shown in the patents to Ainslie and Cluett or the publication "Textiles and Clothing".

2. Nothing amounting to invention over what was previously known is recited in the claims here involved.

3. The claims in suit are unpatentable.

4. Plaintiff is not entitled to a patent containing any of the claims in suit.

5. The complaint should be dismissed.

JENNINGS BAILEY,
Justice.

December 9th, 1940.

132 *Judgment.*

This cause having come on to be heard and having been tried in open court and argued by counsel for the respective parties upon the pleadings and proofs adduced and submitted to the Court,

It is ADJUDGED this 9th day of November, 1940, that the complaint in this case be, and the same hereby is dismissed with costs against the plaintiff.

JENNINGS BAILEY
Justice.

* * * * * * * * * *

133 *Notice of Appeal*

NOTICE IS HEREBY GIVEN that Robert Seyfarth, plaintiff above named, hereby appeals to the United States Court of Appeals for the District of Columbia from the decree entered herein on December 9, 1940, dismissing the complaint.

WILLIAMS, BRADBURY & HINKLE
JAMES H. LITTLEHALES,
Counsel for Plaintiff.

* * * * * * * * * *

134 *Statement of Points to be Relied Upon in the Appeal*

Upon appeal to the Court of Appeals for the District of Columbia in the above entitled cause, plaintiff intends to rely upon the following points:

(1) The court erred in dismissing the complaint herein and in entering the judgment dated December 9, 1940.

(2) The court erred in not finding that the plaintiff is entitled to a patent containing claims 1, 2, 3, 4, 5, 6, and 7 as set forth in application for United States Letters Patent, Serial No. 121,552, filed January 21, 1937.

WILLIAMS, BRADBURY & HINKLE
JAMES H. LITTLEHALES
Counsel for Plaintiff.
867 National Press Building
Washington, D. C.

Service of a copy of the above Statement of Points acknowledged this 23rd day of December, 1940.

W. W. COCHRAN
per ESR

* * * * * * * * * *

BRIEF FOR APPELLANT.

IN THE

UNITED STATES COURT OF APPEALS

FOR THE DISTRICT OF COLUMBIA.

UNITED STATES
COURT OF APPEALS FOR THE
DISTRICT OF COLUMBIA

FILED JUN 14 1941

Joseph W. Stewart
CLERK

No. 7820.

ROBERT SEYFARTH,
Appellant,
vs.
CONWAY P. COE, COMMISSIONER OF PATENTS.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES
FOR THE DISTRICT OF COLUMBIA.

LYNN A. WILLIAMS,
BENJAMIN F. WUPPER,
2300 Board of Trade Building,
Chicago, Illinois,

JAMES H. LITTLEHALES,
867 National Press Building,
Washington, D. C.,
Counsel for Plaintiff-Appellant.

Eastman Bros., Law Printers, 542 S. Dearborn St., Chicago

JUDGE D. LAWRENCE GRONER
UNITED STATES COURT OF APPEALS
WASHINGTON, D. C.
APR 1942

IN THE

UNITED STATES COURT OF APPEALS

For the District of Columbia.

ROBERT SEYFARTH,

vs.

CONWAY P. COE, COMMISSIONER OF PATENTS.

No. 7820.

Appeal from the District Court of the United States for the District of Columbia.

BRIEF FOR APPELLANT.

INDEX.

Jurisdictional Statement 1

Statement of the Case 1

- The Problem Which Confronted the Inventors........ 2
- The True Nature of Shrinkage in Cotton Fabrics.... 4
- Sanford L. Cluett Made Inventions Which Came Close to a Solution of Appellant's Problem........ 7
- Other Attempts Were Made to Avoid the Effects of Shrinkage 14
- Ainslie *et al.* Patent No. 1,480,541........ 18
- Appellant's Process Makes Use of Unique Properties of Wetting-out Agents 20
- Appellant's "Relyonsize" Process Consists of a New Series of Simple Steps 21
- Appellant's "Relyonsize" Process Has Been Commercially Successful 24

Summary of the Facts 24

Summary of Argument 25

Argument 25

- Appellant's "Relyonsize" Process Differs Greatly from the Practice of the Seamstress........ 25
- Appellant's Invention Is Not Anticipated by the "Textiles and Clothing" Publication 28
- Appellant's "Relyonsize" Process Is Not Anticipated by the Ainslie *et al.* Patent........ 29
- Appellant's "Relyonsize" Process Is Not Anticipated by the Cluett Patents 29
- The Question of Whether "Invention" Was Involved Should Be Decided Upon the Evidence........ 31
- Commercial Success Is Indicative of Invention........ 32
- The Findings of Fact Entered by the District Court Do Not Present a Fully Accurate or Complete Picture of the Evidence 34

Conclusion 42

Authorities Cited.

Kurtz *et al.* *v.* Belle Hat Lining Co., Inc., 280 Fed. 277, 282 32
Lucke *et al.* *v.* Coe, 63 App. D. C. 61, 69 Fed. (2d) 379.. 31
Thornton *v.* Coe, 69 App. D. C. 383, 102 Fed. (2d) 247.. 33
Wach *v.* Coe, 64 App. D. C. 235, 77 Fed. (2d) 113.......... 31
Wahl Clipper Corp. *v.* Andis Clipper Co. *et al.*, 66 Fed. (2d) 162 33

JURISDICTIONAL STATEMENT.

This is an appeal from the judgment of the District Court, dismissing the complaint of plaintiff-appellant, filed under the provisions of Section 4915, Revised Statutes, 35 U. S. C. 63, as amended August 5, 1939, C451, Sec. 4, 53 Stat. 1212, to obtain a patent upon an improved method of making clothing. Being a suit arising under the Patent Statutes of the United States, exclusive jurisdiction existed in the United States District Court.

The District Court, as well as the Patent Office tribunals, held that the method of making clothing invented jointly by appellant and Herbert G. Mayer (assignor to appellant of his undivided one-half interest in the patent application Serial No. 121,552, filed January 21, 1937) was not patentable as lacking invention over the prior art.

STATEMENT OF THE CASE.

The invention involved is of that type which, to the uninitiated, appears to have been relatively simple and easy of accomplishment, but which in fact was conceived by the inventors only after a great many experiments, many of which led to *culs-de-sac.*

Even after the method of the invention had been originated and developed, it required a great deal of experiment to bring it to a successful conclusion in securing its commercial adoption.

We should like, first, to discuss the problems which confronted the inventors prior to and at the time they made the invention, and then to review the prior art methods which are available to them, and finally, to show how their invention solved the problems and how the invention differs from the prior art.

The Problem Which Confronted the Inventors.

The inventors, Robert Seyfarth, appellant here, and Herbert G. Mayer, were employees of Reliance Manufacturing Company, one of the largest manufacturers of work shirts and similar clothing in the United States. For years it had been one of the well recognized problems of the clothing industry, particularly of shirt and collar manufacturers, to provide a method whereby an article of clothing could be manufactured and sold which would be of the proper size, not only when the purchaser used the shirt for the first time, but also after repeated laundering. The shirt (which will hereinafter be referred to as representing all similar articles of clothing) should not only be of the proper size initially, but should have the body and feel of new goods.

The inventors knew, at the time they conceived of the invention, that cotton fabric shrinks materially after one or more launderings, and that it was therefore the practice to make shirts considerably oversize so that when the purchaser had laundered the shirt a few times, it would shrink to the proper size (Appellant's App. 44).

Thus, in the past, a person going to a store to purchase a shirt might, for example, request a size 16 shirt. The clerk would hand him a shirt labeled "Size 16," but when the purchaser tried on the shirt he would find that it was much too large. If he used a tape measure, he would have found that the length of the neckband was not 16 inches, as required for a size 16 shirt, but instead was 17 inches or more in length (Appellant's App. 44).

If the purchaser were a fastidious dresser, and not conversant with the trade practices, he might return the shirt to the seller and request one of smaller size, but if he had been better informed, he would merely send the shirt to the laundry a few times with the hope that it would shrink from size 17 to the desired size 16. However, sometimes he would have found that even after repeated launderings the shirt was still larger than size 16, while, with other shirts, he might have found that they shrank to size 15 or 15½ instead of the desired size 16. By and large, a person who was at all particular about size, when buying a shirt, was forced to take a chance that it would ultimately shrink to the desired size (Appellant's App. 44).

It was only after five or six launderings that the shirt finally shrunk to its ultimate size, after which additional laundering operations would not produce further shrinkage (Appellant's App. 48).

This phenomenon of shrinkage of cloth was well known and probably had been known since the prehistoric days when cloth fabric was first made and used.

It may well be asked why shirt manufacturers did not launder shirts a few times before they were placed on the market. There were very good reasons. A shirt which has been laundered a number of times, even though it has never been worn, loses the appearance and feel of new material and appears to be made of an inferior fabric. This is because laundering removes the starches, tallows, and gums impregnated in the fabric and which serve to hold the fibers of the yarns and give "body" to the fabric into which they are woven. A shirt, the fabric of which is flabby and sleazy due to lack of these gums, tallows, and starches, does not have the wearing qualities, and would not be as salable as a shirt which has not been laundered (Appellant's App. 69).

A second reason why manufacturers did not fully shrink the shirts by repeated laundering before selling them was that such laundering operations would add materially to the cost of the shirts. What the inventors, as well as the rest of the industry, wanted to do was to manufacture shirts which would not shrink after repeated launderings but which nevertheless had the fabric, body, weight and feel of new material. To reiterate, everybody knew that by repeated launderings, a shirt could be fully shrunk to a size beyond which no further shrinkage would take place, but such repeated launderings by all known processes necessarily removed the starches, gums, and tallows which improve the wearing qualities and which had to be present in the shirts in order to give them a "feel" and appearance which would make them salable.

The problem confronting the inventors was, therefore, the provision of a method of shirt manufacture by which shirts could be produced which would be fully shrunk to a requisite size, but which would, nevertheless, be made of fabric containing the original gums, tallows, and starches, which imported to the shirts the appearance, feel, and weight of new material (Appellant's App. 13).*

(For the sake of brevity, shirts having these characteristics of being *fully* shrunk and nevertheless containing the original gums, tallows, and starches of the finished fabric material will hereinafter be referred to as "Relyonsized" shirts, the trademark name under which shirts made by Reliance Manufacturing Company in accordance with the method of appellant's invention, are sold.)

The True Nature of Shrinkage in Cotton Fabrics.

Nearly everyone knows that cotton goods, (in common with several other fabric materials,) shrink upon being laundered, that such shrinkage takes place mainly during the first five or six launderings of the fabric, and that thereafter, subsequent launderings result in little or no shrinkage (Appellant's App. 63).

---

* Reference is occasionally made to the opening statement for plaintiff in the Court below, because the facts therein presented were agreed to by counsel for defendant and the Court (Appellant's App. 40).

While everyone knew these facts, there had been no clear explanation of the underlying reasons for such shrinkage. Upon investigation, the inventors discovered the underlying and fundamental reason for shrinkage in cotton fabric. They discovered that *cotton fibers do not shrink,* that is, they do not change in volume, as, for example, iron shrinks when changing from a high temperature to a low temperature. Instead, they found that shrinkage in cotton fabric is initially due to the fact that the cotton fibers are deformed during the processes of manufacturing cloth (Appellant's App. 13, 54).

An understanding of the nature of this deformation and the results flowing therefrom requires a brief explanation of the steps involved in the manufacture of cotton fabrics. The individual cotton fibers, if examined in the cotton boll, are found not to be straight fibers, but instead, to be helical or twisted, something like miniature corkscrews. The individual fibers, approximately one to two inches in length, may be straightened out somewhat by applying tension thereto, just as a coiled spring may be stretched by tensional forces. This stretching of the fiber is not like the stretching of a rubber band in which the strand becomes of reduced cross-section, but is due to the straightening out of the fiber (Appellant's App. 54).

During the processes of manufacture of the yarn, (the threads which are ultimately woven into the fabric,) the cotton fibers are repeatedly subjected to tension as they are ginned, as they pass through the picker, as the fibers are carded, and as they are formed into a sliver during the drawing operation. Further, in the process of manufacture of the yarn, the fibers are drawn through the slubber, the intermediate, and the roving frames, and from thence to the yarn spinner, where the fibers are further again subjected to tension. To facilitate collecting the fibers into a yarn and passing the yarn through the various machines, certain gums and tallows and starches are applied to the fibers to cause them to adhere to one another and to act as a lubricant in these mechanical operations (Appellant's App. 14, 15).

In some of these operations, the fibers are also moistened, and throughout practically all of these operations, the individual cotton fibers are subjected to tension, thus straightening them and increasing their effective length. The fibers are held in this straightened out and elongated condition by the tallows, gums, and starches, the "sizing," which more or less bind the fibers together (Appellant's App. 15).

After the yarn has been made, it is supplied to the looms and woven into fabric. The warp yarns are necessarily maintained under tension during the weaving operation, and the filler yarn (the weft) is likewise tensioned as it is carried back and forth by the shuttle in the weaving operation (Appellant's App. 14).

After the cotton yarn has been woven into a fabric, the fabric is subjected to a number of operations, such as, bleaching, tentering, and calendering, and during all of these operations, the fabric is maintained under tension so that the individual fibers are pulled into their elongated or straightened out condition and are prevented from resuming their wavy or spiral shortened natural shape by the gums, tallows, and starch or other sizing which is applied to the yarn and the fabric during these manufacturing operations. This sizing, consisting of the gums, tallows, and starches, is solidified about the elongated fibers in the final calendering operation, and the fibers are thus "locked" in their straightened out elongated shape by the sizing (Appellant's App. 15).

When the fabric is laundered, the sizing softens up somewhat and some of the fibers are thus freed to resume their natural wavy or spiral shapes. As a result, the yarns of which the fabric is composed, contract, producing what we all know as "shrinkage" of the fabric (Appellant's App. 16).

In a single normal laundering operation, the sizing is not completely softened, and some of the cotton fibers are therefore partially held in their elongated straightened out condition. However, by repeated laundering operations, the sizing gradually dissolves and is loosened from the cotton fibers so that after five or six laundering operations substantially all of the sizing will have been removed and all of the cotton fibers will have resumed their natural wavy or corkscrew shapes. Shrinkage of the fabric will then be complete (Appellant's App. 63).

The question presented was: How could this complete shrinkage of cotton fabric be obtained without a substantially complete removal of the sizing? For reasons previously mentioned, it is essential to the salability of shirts that they have the properties of newly finished fabric which has the weight, lustre, finish, and feel attributable to the presence of sizing.

Sanford L. Cluett Made Inventions Which Came Close to a Solution of Appellant's Problem.

The Cluett patents Nos. 1,861,423 and 1,944,001 (Appellant's App. 86, 98), relied upon by appellee, disclose a method of treating fabrics which has met with merited commercial success because it provided a partial solution to the clothing manufacturers' problem of producing shirts which would not shrink very noticeably, and which retained the appearance of newness. The method of the Cluett patents is widely known and advertised as the "Sanforizing" process (Appellant's App. 17, 49, 50).

We have said that the Cluett Sanforizing process was but a partial solution to the problem which appellant and his associate set out to solve. To understand why the Sanforizing process is not a complete answer or solution to the problem, one must have at least a general understanding of the nature of the process and of the effects of the process upon the fabric.

In the Sanforizing process, the piece goods is slightly moistened. It is then "crinkled" while the sizing is superficially softened by the moisture. The goods is then heated or calendered, again to harden or set the sizing while the goods is in this crinkled condition. The crinkles formed in the fabric are analogous to the crinkles imparted to crepe paper. If we imagine crepe paper coated with sufficient starch and wax so that the paper will maintain its crinkled shape even though pulled slightly, we shall have a very good, though slightly exaggerated, picture of a piece of fabric after having been subjected to the Sanforizing process. To complete the picture, we must imagine that prior to having the sizing coating applied thereto, the crepe paper had longitudinal crinkles formed therein in addition to the usual transverse crinkles.

Describing the results of the Sanforizing process in greater detail, the condition of the fabric resultant from the process may best be imagined by picturing the individual yarns of the fabric as having been compressed. Looking at a single yarn of the fabric, as illustrated, for example, in Fig. 4 of the Cluett patent 1,944,001 (Appellant's App. 98), we see that the yarn y^2 which is marked "I" is generally serpentine or sinusoidal in shape. The upper part of this Fig. 4 represents a section through the fabric in its original condition. In the course of the

Sanforizing process, as previously mentioned, the sizing is softened, and the fabric then compressed in the direction of the length of the yarns (either or both the warp and weft yarns). The results of such longitudinal compression of the yarns are diagrammatically illustrated in the lower portion of Fig. 4, showing that the yarn y^2 has been shortened appreciably by increasing its sinuosity, or increasing the height of the waves in it.

The process of the Cluett patents may be pictured as the reverse of the operation of rolling a piecrust batter. In such rolling operation, the dough is made thinner and the area increased. In the Sanforizing process, the fabric is made thicker and its area decreased by longitudinally compressing the yarns to make them buckle or crinkle.

In the fabric, after having been treated by the Sanforizing process, the individual cotton fibers remain encased in the sizing and retain their straightened-out elongated shape (Appellant's App. 58, 59).

The Sanforizing process, therefore, does not cause *shrinkage* of the goods, using the word "shrinkage" in its normal sense as designating the process which naturally takes place when new clothing is laundered the first few times.

The Sanforizing process is thus not a true shrinking process, but instead, causes a reduction in the area of a piece of fabric by crinkling the yarns thereof. The individual straightened-out cotton fibers are not affected by the Sanforizing process. They remain tensioned in the grip of the sizing gums, tallows, and starches.

Practically speaking, what are the results of the Sanforizing process? Why is it a useful process? When a Sanforized shirt is laundered for the first time and the gum, tallow, and starch sizing thus partially loosened, the crinkles inserted in the cloth by the Sanforizing process disappear, and, were it not for the other factors, the cloth would extend itself to its original size.

However, this does not happen because during the laundering operation, the sizing becomes soaked and softened, and some of the sizing is dissolved, so that *natural* shrinkage of the fabric takes place. Some of the individual cotton fibers are sufficiently loosened from their restraining bonds of sizing that they reassume their natural wavy or corkscrew shape of decreased effective length, and as a result, the yarns in the fabric shrink to some extent, with consequent tendency toward a reduction in area of the fabric. The fabric thus tends to increase in area due to the removal of the crinkling effects of the Sanforizing process, but at the same time, this tendency to increase in area is partially offset by the natural shrinkage of the goods. Most astonishingly, the net effect is that after the first laundering of the shirt, it *increases* in size. This action of Sanforized goods is described in Cluett patent 1,861,423, page 6 (Appellant's App. 93), lines 67 to 85, as follows:

> "A specific instance of preshrinking to accommodate ultimate laundry shrinkage may be my preferred treatment of a 'uniform twill' of which the maximum laundry shrinkage may be determined by test at 2.25 inches per yard in warpwise dimension and 0.55 inches per yard in weftwise dimension after four launderings. The warpwise shrinkage may here occur in increments in successive launderings, and the maximum weftwise shrinkage may be attained in the first laundering. The cloth would be preshrunken preferably by my easily regulable process to these same extents, namely 2.25 inches per yard in warp and 0.55 inches per yard in weft. In the first laundering to which the preshrunken cloth is subjected, it will grow in warpwise dimension, thus offsetting further shrinkage in this dimension."

The impossibility of carrying out the Sanforizing process to obtain the desired results may best be illustrated by a concrete example. Let us assume that it is found that a given fabric, upon its first laundering, shrinks 4%, and upon subsequent launderings, shrinks 2.5%, 1.5%, 1%, .5% and .5%, making a total "ultimate laundry shrinkage" or complete natural shrinkage of 10%.

According to the teaching of the Cluett patents, a sample of the piece goods to be processed would be tested, and this ultimate laundry shrinkage or complete natural shrinkage of 10% determined. The fabric would then be crinkled so as to reduce it in length by an amount of 10%. What would then happen upon the first laundering operation of fabric thus processed? The crinkle inserted by the Sanforizing process would immediately disappear and the fabric would tend to increase 10% in length, but at the same time, natural shrinkage in the amount of 4% would be taking place so that the net result would be that the fabric would have *increased* in length by 6%.

Upon completion of the second laundering operation, the fabric would shrink further so that the total shrinkage would then be 6.5% (4.0% + 2.5%), and upon additional laundering operations, the fabric would shrink successively and cumulatively 8%, 9%, 9.5%, and finally, a total of 10% after the completion of the sixth laundering operation.

From the above example, which we believe to be a fair estimate of the results which might readily occur, it will be apparent that the Sanforizing process is not a fully satisfactory solution of the problem which appellant and his co-inventor set out to solve, even if it be assumed that the Sanforizing process is always pains-takingly and scientifically performed in the manner set forth in the Cluett patents.

The Sanforizing process can be carried out only on the piece goods, and *cannot* be utilized upon finished articles of clothing. Appellant's licensee, the Reliance Manufacturing Company, manufactures shirts from the regular finished piece goods and also from Sanforized piece goods. The testimony of Mr. Herbert G. Mayer, of the Reliance Manufacturing Company, and of Mr Albert K. Bard, also of this company, is therefore enlightening as to the merits of the Sanforizing process.

Mr. Mayer testified that in the manufacture of shirts, the piece goods is laid out in lengths of 225 feet, 300 layers thick upon a cutting table, by a spreading machine (Appellant's App. 50, 51). Inevitably, in this process of spreading the cloth over the cutting table, the cloth is placed under tension, and this tension tends to remove some of the superficial crinkles in the Sanforized cloth.

As the fabric proceeds through the various manufacturing processes leading toward the completion of a shirt, the fabric is repeatedly subjected to tension. In the various sewing operations, the operator must hold back on the fabric as it is fed into the sewing machine, and in doing so, applies tension which tends to remove more of the superficial crinkles from the fabric (Appellant's App. 53, 55). Further, as the making of the shirt proceeds, it is pulled and pressed in shape for packaging and the material is thus further stretched, thereby removing more of the Sanforizing crinkles from the fabric.

As a result of the performance of these numerous operations upon the Sanforized cloth, the finished shirt may have a potential shrinkage of 2% or 3% even though the Sanforized piece goods from which it was made had a "potential shrinkage" of less than 1%.

There are a number of reasons why the processes employed in the manufacture of shirts cannot be as satisfactorily performed on Sanforized piece goods as upon ordinary calendered piece goods as it comes from the mill.

As above pointed out, Sanforized piece goods is crinkled somewhat like crepe paper, so that it is more difficult to spread upon the cutting table, because care must be taken that the Sanforizing crinkles are not removed by stretching the cloth as it is spread, about 300 layers deep, on the 250 foot length cutting table.

In the cutting operation, the men operating the cutting machine experience more difficulty because of the less rigid nature of the material and consequent slippage of the yarns, and it has been found that the cutting knives have therefore to be sharpened much more frequently when cutting Sanforized fabric than when cutting ordinary sized or calendered piece goods (Appelant's App. 51).

After the pieces have been cut, it is necessary to turn or crease them. This is done by folding the pieces by means of a suitable machine to form the turned-in hems. With the relatively less rigid Sanforized fabric, the operator must handle each piece separately in the creasing machine, because the material does not hold a crease very well (Appellant's App. 76). On the other hand, ordinary fabric which has not been Sanforized creases readily and holds its crease better so that the operators of the creasing and turning machines may simultaneously crease two pieces. Thus, the cost of turning and creasing operations is substantially doubled when using Sanforized material (Appellant's App. 51, 52).

In sewing the pieces together to form the shirt, the operator has more difficulty in handling the Sanforized pieces because they are more flabby than ordinary piece goods and therefore are more difficult to feed to the sewing machines. This greater difficulty of handling the pieces is present during all of the large number of sewing operations, except such operations as sewing around button holes and sewing on buttons.

There is no such thing on the market as pre-shrunk thread (Appellant's App. 70), and therefore, when a shirt is made of Sanforized fabric, it must be sewed with unshrunk thread. As a result, the shrinkage of the thread in the finished shirt causes the seams to pucker (Appellant's App. 71).

In general, these factors make it cost more to manufacture a shirt out of Sanforized piece goods than out of goods of ordinary manufacture (Appellant's App. 55).

We do not wish to be-little the value of the Sanforizing process, for even if it were effective to reduce the potential shrinkage of a shirt from 8% or 10% to 2% or 3%, the process would be well worth while. We wish, however, to emphasize these unavoidable deficiencies in the Sanforizing process so as to be able more clearly to show the true nature of appellant's invention.

Other Attempts Were Made to Avoid the Effects of Shrinkage.

Many other attempts have been made to avoid the effect of the inconvenient shrinkage of articles of clothing.

The housewife dressmaker knew of the phenomenon of shrinkage, and usually made allowances by cutting the pieces of the garment somewhat oversize, with the hope that after the garment had been completed and laundered it would shrink to the desired size. Probably some of the more careful seamstresses followed the precept set forth in the book by Kate H. Watson, "Textiles and Clothing," (Appellant's App. 83) reading as follows:

> "Shrinking of material before making is desirable in wash goods which will be laundered soon. Wash materials which will be worn a good many times before washing should not be shrunk, as wetting removes or disturbs the finish, and they will then muss or soil

> more easily. Allowance can usually be made in some way for shrinkage. A sample of the material may be measured, then washed, pressed and measured again to determine the percentage of shrinkage."

This publication advises two alternative methods for avoiding or minimizing the undesirable effects resultant from the phenomenon of shrinkage. If the garment is of such character as will be laundered soon after being completed, this book suggests that the material be shrunk *before* making up the article of clothing. On the other hand, if the garment is to be worn a good many times before washing, it suggests that the goods should not be shrunk because of the fact that wetting disturbs the finish or newness of the goods, causing it to soil and muss more easily. Under the latter conditions, the author advises that a sample of the material should be measured, washed, pressed, and measured again, and by comparison of the measurements, the percentage of shrinkage should be determined; and that the pieces of the article of clothing should be cut sufficiently oversize to allow for this measured and anticipated shrinkage.

There are fundamental reasons why neither of the two methods proposed in this book could practically be used in the manufacture of work shirts.

The first method,—of shrinking the cloth before making the article of clothing,—is unsatisfactory because in accomplishing such shrinkage, the cloth loses its luster and finish due to the removal of the sizing. The appearance of newness is entirely removed from the goods. A shirt made by this method would not be salable (Appellant's App. 45).

A shirt made in accordance with the second method proposed in the Watson book is little better than a shirt made in accordance with the prior common practice of cutting the pieces a little large to make allowance for expected shrinkage. This second method gives the maker of the clothing a guide to aid him in determining the amount of allowance which should be made for shrinkage, but the guide thus furnished is misleading to some extent and does not enable the maker to produce a shirt which would initially be of the proper size and which would maintain this size throughout its use. Specifically, there are three reasons why Watson's second proposed method is not commercially satisfactory.

First: The shirt as purchased would be considerably oversize, and the purchaser would have to launder it a number of times before it would be completely shrunk. Thus, the purchaser would have to wear an oversize shirt through a considerable portion of its useful life, or would have to launder the shirt a number of times before wearing it the first time (Appellant's App. 69, 70).

Second: The method proposed does not take into account that cloth shrinks by different percentages in the direction of the warp and in the direction of the weft. A particular cloth may shrink as much as ten or twelve percent in the direction of the warp yarns, while shrinking only two or three percent in the direction of the weft yarns. Unless the dressmaker discovered this, and took it into account in laying the patterns on the goods from which the pieces were to be cut, in a manner to take into consideration the difference in the warp and weft shrinkage, the shirt would still shrink annoyingly in one place or another, depending upon the direction in which the warp extended in the finished garment (Appellant's App. 67, Plf. Exs. Nos. 6A and 6B).

Third: The Watson publication suggests merely that the sample be ''washed.'' It is an interesting but not generally known fact that shrinkage of cloth takes place progressively upon repeated launderings, and that the ultimate shrinkage may not be obtained until after the cloth has been laundered a number of times,—as many as six or seven. Thus, a dressmaker, endeavoring to follow the advice of the Watson book, might be led away from, rather than toward, a complete and accurate solution of the problem (Appellant's App. 69).

While the methods proposed in the Watson book do furnish some amelioration of the difficulties of making clothing of proper size, the suggestions were such as could not be followed practically in the quantity production of shirts. A more or less complete shrinking of the goods before cutting and sewing the shirt would not be at all feasible in the quantity manufacture of shirts (Appellant's App. 66, 67).

It is essential that the methods employed in the quantity manufacture of shirts shall be carried on very efficiently with the minimum amount of skilled labor, since the manufacture and sale of shirts is highly competitive, and a difference of a cent or two in the cost of manufacturing a shirt which sells at wholesale for 38½ cents may well determine whether the manufacturer incurs a loss or makes a profit.

In the process of laundering cloth, a large proportion of the sizing of the goods is removed and it becomes rather sleazy to the touch and in appearance. Such sleazy material would be difficult for the machine operator to handle. When it is considered that the manufacture of a work shirt requires very many different machine operations, it will be clear that the sleazy condition of the material, as would result from a preliminary washing, would make the various operations more difficult and increase the cost of production. The first method proposed by Watson has not in any sense revealed a practical solution of the problem which the inventors here have solved.

The second proposal of the Watson book likewise does not constitute a commercially practical solution of the problem solved by the applicants, Seyfarth and Mayer. Even if cognizance were taken of differences in the warp and weft shrinkage of the goods, and, (as nowhere is disclosed in the prior art,) allowance were properly made for this difference in percentage of shrinkage, the method would still not be commercially practical because the purchaser would be buying an oversize shirt, and, when wearing it for the first time, and even after the shirt had been laundered one or two times, he would still find the shirt to be oversize.

Ainslie et al. Patent No. 1,480,541.

The patent to Ainslie *et al.* No. 1,480,541 (Appellant's App. 79) discloses a process by which the patentees sought to manufacture collars from unfinished piece goods, that is, goods which had not been bleached, sized, or calendered. The patentees describe such goods by the trade designation, "gray goods."

In the Ainslie process, the pieces of which the collars are to be made, are cut from the gray goods. The pieces are then sewed together to form the collar. The otherwise completed collar is then bleached, shrunk, and starched.

The only portion of the disclosure of this patent having any possible relevancy appears on page 2 (Appellant's App. 80) of the patent, lines 6 to 16, where it is said that:

> "The piece goods as it comes from the loom may be singed if desired, after which it is removed to the cutting room where the blanks are cut to larger size allowing for shrinkage. For a 15 collar, the blanks will be cut between 15-½ and 15-¾ size, preferably about 15-¾, as it is preferable to have a finished collar slightly oversize than slightly undersize. Other sizes will be cut in proportion, including both the outside and the interlining where an interlining is used. . . ."

With reference to this process, Mr. Mayer testified (Appellant's App. 65):

> "Q. 108. Have you read and do you understand the Ainslie patent No. 1,480,541?
>
> "A. Yes, I have.
>
> "Q. 109. Could the process described in that patent be applied in the case of shirts or garments which are colored, when finished?
>
> "A. No, it could not.
>
> "Q. 110. Will you explain briefly why not.
>
> "A. Well, for two reasons. In the first place, you cannot dye or bleach a shirt that has been colored, after it has been made up. You must have the dye or bleach or the printed matter on the shirt before it is manufactured, because there is no art or machinery that will dye or bleach or print shirts after they have been made up into the shape of a shirt as distinguished from a continuous band that piece goods is made up in.
>
> "Q. 111. Does this Ainslie patent disclose any method or means for giving a garment in advance of its sale the precise dimensions which it will have after a succession of washings or launderings sufficient in number to eliminate the possibility of any further shrinkage?
>
> "A. It does not.
>
> "Q. 112. Why not?
>
> "A. Well, all the Ainslie patent describes is simply cutting some blanks, oversize patterns, and then dyeing and washing them, and the net result of that patent or of the process there would be simply to produce a garment that would have some of the sizing taken out, but without any relationship to further shrinkage.
>
> "Q. 113. Does the Ainslie patent take any account or make any references to shrinkage in more than one direction?
>
> "A. No, it does not.
>
> "Q. 114. Have colored work shirts ever been manufactured in accordance with the method described in the Ainslie patent and been sold, in so far as you are aware?
>
> "A. Not to my knowledge."

Elsewhere Mr. Mayer had testified that his company was the largest manufacturer of work shirts in the country and that he believed that he was in a position to know whether work shirts had been made by this process (Appellant's App. 66).

Appellant's Process Makes Use of the Unique Properties of Wetting-out Agents.

Chemists have discovered that when certain chemicals are added to water, the penetrating properties of the water are enormously increased. These chemicals are termed "wetting-out agents" or "penetrating agents."

Due to the phenomenon of surface tension, water tends to avoid soaking into materials having an oily surface. Thus, the duck floats easily because the water does not penetrate into the interstices of its oily surface feathers, and the duck is buoyed by a surrounding layer of air-filled feathers. If a duck were placed in water containing a penetrating or wetting-out agent, the water would penetrate to the duck's skin, its feathers would become soggy, and the duck would have difficulty remaining afloat.

In the same way, in finished cotton piece goods, the wax or tallow sizing repels water, making it difficult to wet the fabric *thoroughly.* Thus, mere immersion in water, or mere laundering of a piece of cotton fabric, does not cause the water to penetrate the interstices between the cotton fibers, and the sizing material is softened and loses its bond only at the fabric surfaces. If, however, a wetting-out agent were employed, the water would penetrate the fabric and surround each individual cotton fiber, thereby softening each encasement of the fiber sizing, and thus in effect removing the "straight-jacket" in which each fiber is held.

When the sizing which encases each individual fiber is thus softened, each individual fiber is free to reassume its wavy or corkscrew shape. When this occurs in all the fibers, *complete* shrinkage is obtained.

Consequently, by using a "wetting-out agent," the goods may be completely shrunk in *one* operation of a few minutes duration, whereas, four or five or more ordinary laundering operations are required to produce this result (Appellant's App. 48).

Appellant's "Relyonsize" Process Consists of a New Series of Simple Steps.

In the process disclosed and claimed in appellant's application for patent, (Appellant's App. 105 to 116), regular sized, calendered, and finished piece goods is used throughout all of the steps of cutting, folding, and sewing the pieces into a complete oversize shirt. At that stage, the otherwise completed shirts are thoroughly wetted in water containing a "wetting-out agent." Almost instantly the sizing which encases each individual fiber of each yarn of the fabric is softened, thereby permitting all of the fibers to draw themselves up into their natural corkscrew forms. The sizing is not, however, scrubbed or otherwise washed away. The bulk of it is left in the fabric of the shirt.

After the shirt has been completely shrunk in this manner, it has a large portion of its water removed by means of a centrifugal extractor. The shirt is then pressed on a heated flat pressing buck so that no stretching of the fabric takes place during this operation. This operation drys and hardens and re-sets the sizing,—but now in such a way as to grip and encase the shortened corkscrew fibers of a fully pre-shrunk shirt. The shirt is then folded and packaged, and is ready for sale. It retains the sizing and therefore the feel and the finish of a "new" garment.

More specifically, in carrying out the process of appellant, a sample of predetermined size is cut from each lot of piece goods from which shirts are to be made. This sample is thoroughly wetted in a solution of the wetting-out agent, such as a naphthalene sulphonic acid derivative in water. A single wetting with this solution will cause complete shrinkage of the sample in a very short time. The shrunk sample is then measured to determine the percentage of shrinkage which has taken place in both the warp and the weft directions (Appellant's App. 108, 109).

In the quantity production of shirts, the factory maintains certain patterns in accordance with the dimensions of each component piece of each size of shirt. These patterns are termed "standard patterns" and represent the actual dimensions of the pieces of the shirt as desired in the finished and fully shrunken shirts.

Using the information obtained by the complete preshrinkage of a sample of the goods, a set of working patterns is then prepared, the dimensions of these working patterns being increased over those of the standard patterns, in the warpwise direction by an amount just sufficient to precompensate for complete shrinkage in the warp direction. Similarly, the weft dimensions of the working patterns are increased over the corresponding dimensions of the standard patterns by amounts just sufficient to precompensate for the shrinkage in the weft yarns as determined from the percentage of the weft shrinkage in the sample.

Then, using the working patterns, laid on the goods in a predetermined direction with respect to the warp thereof, the numerous pieces which compose a shirt are cut. These are subsequently sewed together to form an oversize shirt.

This sewn shirt is then immersed for a moment in water containing a wetting-out agent, such as a naphthalene sulphonic acid derivative, and slightly agitated in this solution. By being immersed and slightly agitated in this wetting-out agent, a complete natural shrinkage of all of the fibers of the fabric takes place. The shirt is then of exactly the desired final dimensions. After this "quick wetting-out operation," the solution is extracted from the shirts, preferably using a centrifugal extractor which has no tendency to stretch the goods. The shirts are then ironed and pressed on a flat pressing buck, which again avoids any stretching of the individual cotton fibers.

The solution of the wetting-out agent, due to its low surface tension, has the ability to penetrate the fabric and the starches, gums, and other sizing with which the individual cotton fibers are encased and held in their elongated condition. Such penetration is so complete and rapid that complete natural shrinkage of each fiber takes place in the one wetting operation of two or three minutes duration. As contrasted with this quick and complete softening of the sizing in a single two minute immersion, four or five or more ordinary laundering operations would be required to obtain the same amount of shrinkage. But the four or five laundering operations would actually scrub and wash away and remove the sizing so that the shirt would be left with the soft sleazy appearance of an old and long worn garment. Furthermore, four or five laundering operations would subject the shirts to just so much unnecessary wear (Appellant's App. 48).

Appellant's "Relyonsize" Process Has Been Commercially Successful.

Appellant's process has been in commercial use in the production of work shirts for several years, commencing in the latter part of 1936. In 1937, 226,000 shirts made by this process were sold; in 1938, sales were 383,931; in 1939, 509,000 (Appellant's App. 94). These sales were made without special advertising, and despite the fact that they were made at a wholesale price $.75 per dozen higher than the price of otherwise similar shirts not made by this process (Appellant's App. 71).

The use of appellant's process made it possible for the purchaser to buy a shirt which would "fit" when he first put it on, and for the manufacturer to guarantee to the customer that the shirt would not subsequently shrink. As to the more than 1,000,000 shirts made by this process which have been sold, there has not been a single call upon the manufacturer to make good on its guaranty to replace a shirt because of shrinkage (Appellant's App. 49). As shown by Plaintiff's Exhibit 8-B, shirts made under this process bear a permanent label, reading: "Relyonized—Another Free If It Shrinks."

SUMMARY OF THE FACTS.

There is not even a contention that the process of these applicants, Seyfarth and Mayer, is anticipated,—not even a contention that anyone ever made or disclosed a process of making any garment in accordance with the procedure described and claimed by these applicants for a patent.

Whether the applicants' process is better than any other process of the prior art, is immaterial,—it is at least different,—and that is all that the law requires. (We believe that it is the best known process of making a finished, salable, and non-shrinkable shirt.)

The only issue involved in this appeal is whether, in view of the prior art, it involved "invention" to conceive and develop to a successful conclusion the "Relyonsize" process as defined in claims 1, 2, 3, 4, 6, and 7 of the Mayer and Seyfarth application.

SUMMARY OF ARGUMENT.

1. Appellant's Relyonsize process is new and differs materially from every known prior art process. By the use of this process, shirts of completely novel and highly advantageous properties may be manufactured.
2. Whether "invention" was involved in a particular improvement should be decided on the factual evidence in each case rather than upon the wisdom of hindsight and personal reactions of the judicial tribunal. The real test is the effect which the improvement has upon the industry to which it appertains.
3. Fulfillment of a long-felt want in a highly developed art, usefulness, simplicity, economy, acceptance by the industry, and commercial success, constitute persuasive evidence of invention.

ARGUMENT.

Appellant's "Relyonsize" Process Differs Greatly from the Practice of the Seamstress.

During the course of the trial, it was stipulated that "it has long been the practice for housewives, in making garments from shrinkable goods, to make the garments larger than the desired size, in order to allow for subsequent shrinkage" (Finding 19, Appellant's App. 207).

In appellant's Relyonsize process, as distinguished from this haphazard method employed by housewives, a sample is cut from each lot of piece goods from which shirts are to be made. This sample is immersed and lightly agitated for a moment in water containing a wetting-out agent,—a chemical of which housewives had no knowledge. By means of this treatment, the sample is completely "shrunk." The housewife, in once washing a piece of goods, could not obtain complete shrinkage. She would have to wash the piece of goods four or five or more times to obtain such complete shrinkage.

In the Relyonsize process, standard patterns of exactly the dimension desired in the finished shirt are utilized as a base for the preparation of working patterns. These working patterns are adapted to be laid upon the piece goods in a predetermined direction with respect to the warp of the goods, and are of dimensions just sufficiently larger than those of the standard patterns to precompensate exactly for the shrinkage which will take place, as determined from the shrinkage of the sample. The housewife never did anything of this character. At most, she may have cut the material by leaving a small margin around the patterns so as to make some haphazard allowance for expected shrinkage.

With these working patterns as guides, the pieces are cut from the fabric. Such cutting is done by machines capable of cutting as many as 300 or more plies of fabric at a time,—something which the housewife never contemplated.

The cut pieces are then sewed together and the shirt completed by attaching buttons and stitching the button holes, etc. But this shirt, at this stage, is a misshapen monstrosity as compared with the desired shirt of standard dimensions. Generally, the shrinkage is much greater in the warp than in the weft direction, and since precompensation has been made for the expected shrinkage, some portions of the shirt will be relatively full. This shirt, more oversize in some dimensions than in others, is then quickly immersed and slightly agitated in water containing a wetting-out agent. This momentary wetting results in the softening of all of the confining bonds of the sizing so that all of the individual fibers may contract in length to their ultimate natural shapes, thus instantaneously effecting a complete natural shrinkage of the fabric. When thus shrunk, the shirt is of a size corresponding exactly with the ideal of the "standard patterns." Furthermore, when dried and ironed and folded, it has all of the appearance and finish and feel,—*i.e.,* the sizing—of a brand-new garment. Neither the housewife nor anyone else ever attained such complete shrinkage of a shirt before it was worn,—to say nothing of its new store finish and feel. Even if the housewife laundered the shirt before it was to be worn, the shirt would shrink only partly. It would not be until after the shirt had been laundered four or five or more times that it would have attained its complete ultimate shrinkage. And in this laundering operation, the sizing, the feel, and the finish of a new garment would have been dissolved and rubbed and washed away.

In appellant's "Relyonsize" process, care is taken not to stretch the fabric of the sewn-up garment after it has thus been completely shrunk. For this reason, the shirt is ironed and dried and pressed on a flat pressing buck,—something which was never before done by the housewife or in the industry (Appellant's App. 48).

All of the foregoing steps of the process or method of manufacturing a shirt are serially set forth in claim 1 (Appellant's App. 4, 5). This claim specifies that the shrinkage of the sample and the shrinkage of the otherwise completed shirt is obtained by "thoroughly wetting" the fabric which, according to the specification of the Mayer and Seyfarth application, is accomplished by using a wetting-out agent, such as a naphthalene sulphonic acid derivative (Appellant's App. 108, 110).

In claim 4 (Appellant's App. 6), the use of the wetting-out agent is more specifically set forth. The claim, however, is not as specific as claim 1 as to the other detailed steps of the process.

Claims 2, 3, 6, and 7 differ in scope from claims 1 and 4, but do not, we believe, set forth the invention any more clearly than claims 1 and 4.

Appellant's Invention Is Not Anticipated by the "Textiles and Clothing" Publication.

The text book, "Textiles and Clothing" (Appellant's App. 83) adds nothing relative to the issue here involved, as compared with the old and well known practice of the housewife, except that an indication of the degree of shrinkage may be obtained by pre-testing a sample. In this respect, the publication is misleading, since one would understand from it that complete shrinkage of the sample may be obtained by a single washing operation. After following the recommended procedure, the housewife would be disappointed to find, after the shirt had been laundered a number of times, that it had shrunk considerably more than her pre-test had led her to expect and despite her care in endeavoring to predetermine the shrinkage in accordance with the disclosure of this book. Whatever success the housewife might attain, in preventing further shrinkage of her new shirt, would necessarily be at the sacrifice of all of that finish and feel which are characteristic of a salable new garment.

Appellant's "Relyonsize" Process Is Not Anticipated by the Ainslie et al. Patent.

Ainslie *et al.* endeavored to provide a solution for the problem of overcoming the effect of shrinkage by making collars from gray goods. They proposed cutting the collar blanks from unbleached, unfinished so-called "gray goods," and suggested that the blanks be cut a half-size or three-quarters-size larger than the desired size to make a haphazard allowance for expected shrinkage.

Ainslie *et al.* did not suggest a careful predetermination, from a sample, of the shrinkage in the warp and weft directions, and a precompensation for such shrinkage in the sizes to which the blanks were cut; nor did they suggest using a wetting-out agent to secure complete shrinkage of the fabric within a few minutes. The very great difference between appellant's "Relyonsize" process and the process of the Ainslie *et al.* patent is clearly apparent from the chart which appears on page 169 of Appellant's Appendix.

Appellant's "Relyonsize" Process Is Not Anticipated by the Cluett Patents.

The Sanforizing process shown in the Cluett patents bears no resemblance to appellant's Relyonsize process except that Cluett had as his goal the production of a new garment which would not subsequently "shrink." Instead of making it possible to manufacture a shirt which has been completely shrunk, the Sanforizing process enables the manufacturer to produce a shirt, the fabric of which is superficially crinkled by longitudinally compressing the yarns of which the fabric is composed so as to increase their sinuousity. Such compression or crinkling of the fabric is of an extremely temporary character, the effect of which is removed upon the first laundering operation.

The Sanforizing process comes close to a solution of the problem. It does not fully solve the problem because it does not produce natural shrinkage. In the Sanforizing process, the fabric is crinkled *as a substitute for shrinkage.* This is a vital distinction between appellant's process and that of the Cluett patents.

The facts that the spreading, cutting, folding, creasing, and sewing operations may be performed more easily, quickly, and economically upon regularly finished fabric than upon Sanforized fabric makes appellant's process more desirable from the manufacturer's point of view. The Sanforized fabric, upon successive laundering operations, first increases in size and then subsequently gradually shrinks to its ultimate size, whereas, a shirt made by appellant's process will not change in size from the day it is purchased until the day it is discarded. This represents an important advantage to the purchaser of a shirt made by appellant's "Relyonized" process. But whether better or not better than the Cluett process, the applicants' process is in any event a different process;—and that is *all* that is required for the grant of a patent.

To summarize, the features of novelty of applicants' invention reside in precompensating exactly for the shrinkage in both the warp and weft directions, as determined from the complete shrinkage of a sample of the fabric; in performing all the spreading, cutting, and sewing operations on regularly sized fabric; in thoroughly wetting the otherwise completed shirt, using a penetrating or wetting-out agent, and thereby retaining the sizing within the fabric; and in pressing and folding the shirt without stretching, thereby drying and resetting the sizing in such a way as to produce a shirt having all of the finish, feel, and appearance necessary to the salability of a new garment.

The prior art does not disclose this process, nor does it disclose *any* process by which these results may be obtained.

The Question of Whether "Invention" Was Involved Should Be Decided Upon the Evidence.

The courts have frequently applied the principle that the question of "invention" should be determined, not by hindsight and *ex cathedra* logic, but rather upon evidence showing the effect of the improvement upon those of the industry who had the problem before them.

In *Wach* v. *Coe,* 64 App. D. C. 235; 77 Fed. (2d) 113, 114, this Court said:

> "It thus appears that the best marine engineers in the world, with unlimited means at their command, failed to solve the problem, the solution of which the tribunals of the Patent Office and the court below have ruled to be obvious to any one skilled in the art.
>
> "While appellant's solution of the problem was as simple as it was efficient, it by no means follows that it did not involve invention. . . ."

Again, in *Lucke et al.* v. *Coe,* 63 App. D. C. 61, 69 Fed. (2d) 379, 383, this Court said:

> "The record discloses that the Hoover Company maintains a corps of engineers whose duty it is to design improvements in suction cleaners. All the patents relied upon by the Patent Office as anticipating Lucke's device were before these engineers, yet, highly skilled in the art as they were, they were unable to do what Lucke has done; namely, produce a machine that is a greater advance over the prior art than any one of the patents referred to by the Patent Office tribunals. It is comparatively easy, now that the Lucke device is in evidence, to take this and that from the references and achieve a *nunc pro tunc* solution of the problems confronting Lucke when he made his invention. We rule, therefore, that the claims denied by the Patent Office should be allowed."

Judge Hough made an interesting and comprehensive observation as to what is and what is not invention, in *Kurtz et al.* v. *Belle Hat Lining Co., Inc.*, 280 Fed. 277, 282. In his opinion, Judge Hough concluded his discussion of an ingeniously simple invention in hat linings by saying:

> "If we viewed this hat lining, or any hat lining, in the light of our own experience, it would appear trivial and unworthy the dignity of patent protection; but, looking at it through the evidence and (we hope) with the eyes of the hat lining trade, this patent represents a large and successful business. It is in the minds of all those who deal in hat linings, of the utmost importance. No one ever made a lining of such simplicity, cheapness, and general adaptability as has Kurtz, and he has done it by mechanical means of winning simplicity, to all of which defendant has testified by deliberately imitating Kurtz's product and engaging in expensive litigation to defend the imitation.
>
> "We are of opinion upon this record that Kurtz's hat lining is novel, useful, and displays patentable invention."

The Patent Office tribunals did not have the testimony of witnesses to provide them with a basis for a determination of the question of invention, nor did the District Court await the introduction of evidence before concluding that no invention was involved (Appellant's App. 38, 39).

Commercial Success Is Indicative of Invention.

While mere commercial success is not conclusive on the question of whether invention was involved, the authorities uniformly consider such evidence of popular approval of the invention as a factor entitled to weight.

The fact that over a million shirts manufactured according to the "Relyonsize" process have already been sold, is rendered of greater significance because of the fact that shirts manufactured by this process sold at a wholesale price of $.75 per dozen higher than otherwise identical shirts which were not preshrunk and finished by this process. The following observation of the Seventh Circuit Court of Appeals, speaking through Judge Alschuler, in *Wahl Clipper Corporation* v. *Andis Clipper Co. et al.*, 66 Fed. (2d) 162, 165, is significant in this respect:

> ". . . In most instances, the judgment of those who pay their money to secure the benefits of the patented article is truer and better than the opinion of experts or the speculations of an arbitrator. Inasmuch as experience is more reassuring than theorizing, and history more certain than prophecy, so the test of public approval, if uninfluenced by detracting factors, must afford the weightiest proof obtainable determinative of invention. In short, in construing the patent statute, which was enacted to promote the useful arts, it is more important to study those developments of the art which are bright with use in the channels of trade than to delve into abandoned scrap heaps and dust-covered books which tell of hopes unrealized and flashes of genius quite forgotten. . . ."

The significance of appellant's improvement is more striking when one takes into consideration the fact that it relates to an art which is very old. The problem solved by the invention was, or should have been, evident to the millions who suffered and were annoyed by choking neckbands and shortened sleeves, resulting from shrinkage.

This Court recognized that the length of time a problem confronts an industry constitutes a basis for determining the question of whether invention was involved in its solution, stating in its decision in *Thornton* v. *Coe*, 69 App. D. C. 383, 102 Fed. (2d) 247, 252:

> ". . . It appears that the problem of spreading of the heads of warper beams confronted the textile

> industry for at least eight years after the issuance of the patent to Peterson, before Thornton solved it with the adjustable disc; and it appears that Thornton's improvement was a distinct success. This is highly persuasive of invention. 'Where the method or device satisfies an old and recognized want, invention is to be inferred, rather than the exercise of mechanical skill. For mere skill of the art would normally have been called into action by the generally known want. See (Webster) *Loom Co.* v. *Higgins,* 105 U. S. 580, 591 (26 L. Ed. 1177); *Krementz* v. *Cottle Co.,* 148 U. S. 556, 560 (13 S. Ct. 719, 37 L. Ed. 558); *Hobbs* v. *Beach,* 180 U. S. 383, 392 (21 S. Ct. 409, 45 L. Ed. 586); *Carnegie Steel Co.* v. *Cambria Iron Co.,* 185 U. S. 403, 429, 430 (22 S. Ct. 698, 46 L. Ed. 968); *Expanded Metal Co.* v. *Bradford,* 214 U. S. 366, 381 (29 S. Ct. 652, 53 L. Ed. 1034).' *Paramount Corp.* v. *Tri-Ergon Corp.,* 294 U. S. 464, 474, 55 S. Ct. 449, 79 L. Ed. 997, 1925. . . ."

The Findings of Fact Entered by the District Court Do Not Present a Complete Picture of the Evidence.

The District Court adopted and entered certain findings of fact which are wholly unsupported by the evidence, and failed to adopt and enter other findings proposed by plaintiff-appellant. Of the findings proposed by plaintiff-appellant (appearing in Appellant's App. at pages 195 to 202), the District Court failed to adopt proposed findings 12-14, 17, 18, 23-25, 27, and 28, despite the fact that these findings were fully supported by unrebutted testimony. We believe that the District Court's erroneous conclusion may have been based in part upon its failure to understand the significance of these proposed findings. We shall therefore point out the pertinency of each of these findings and show how each is fully supported by the evidence.

"12. Shirts manufactured in accordance with the

Relyonsize process of the Mayer and Seyfarth application do not change in dimensions as a result of wear or laundering."

This proposed finding is fully supported by the unrebutted testimony of Mr. Mayer, as follows (Appellant's App. 71):

> "Q. 140. . . . Do the dimensions of your Relyonsize shirts made in accordance with your patent application change their dimensions after being sold (and) either by enlarging or by contracting and as a result of wear or laundering?
>
> "A. They do not change in dimensions."

> "13. By no known process other than that disclosed in the Mayer and Seyfarth application is it possible to produce a garment shrunk to its maximum extent and containing a large proportion of the original sizing by which the appearance, 'feel,' and wearing qualities of new goods is retained."

A shirt made by the Sanforizing process of the Cluett patents is not shrunk to its maximum extent, while a shirt or collar made by the method of the Ainslie *et al.* patent is neither shrunk to its maximum extent nor does it contain any of the original sizing. Likewise, a shirt made in accordance with the method described in the "Textiles and Clothing" publication either would not be shrunk at all (if made in accordance with one of the two proposals), or would neither be fully shrunk nor contain a large proportion of the original sizing (if made by the other of the two proposals).

> "14. There is not on the market in the United States a cotton thread which has been shrunk."

This proposed finding is fully supported by the following testimony of Mr. Mayer (Appellant's App. 70, 71):

> "Q. 137. Now, what about the thread that is used

> in manufacturing a shirt of Sanforized material? Does that shrink, or does it not shrink?
>
> "A. Well, of course, all thread is cotton, just like the garment, and like any other piece of cotton goods, and the cotton thread has the same properties that cotton cloth has, and there is not at the present time and there never has been to my knowledge any such thing as shrunk thread, and consequently if you sew a shrunk piece of goods with unshrunk thread, the thread will shrink when it hits the water, and consequently there will be a pulling in or a shrinkage or a contraction of the thread, which will make a puckering in the cloth if the thread happens to shrink more than the cloth."

From this testimony, which was not rebutted in any way, it is clear that when unshrunk thread is used to sew a garment from preshrunk or Sanforized piece goods, the shrinkage of the thread causes pulling and puckering of the garment along the seams. In the "Relyonsize" process, the garment is sewed from unshrunk piece goods and unshrunk thread is used, but both the thread and the goods are shrunk together so that there is not this differential shrinkage effect, which, in other processes, caused the goods to pull and pucker.

> "17. In the manufacture of garments using piece goods which has been Sanforized, the goods is unavoidably stretched due to the tension which must be placed upon it during various manufacturing operations, and as a result, the benefits of the Sanforizing process are partially lost. A finished garment made of Sanforized piece goods will ultimately shrink more than Sanforized piece goods subjected to the same laundering operations."

Mr. Bard testified as follows (Appellant's App. 76, 77):

> "Q. 16. Now, is the stretching which occurs inevitable in feeding the goods into that folder of the sewing machine, which takes the crinkles in some measure

> out of the Sanforized material and puts stretch into the goods?
>
> "A. It does.
>
> "Q. 17. So the shirts come out larger than would be represented by the Sanforized material itself before it is put into the work?
>
> "A. Yes, sir."

Mr. Mayer's testimony also serves as an unrebutted basis for this proposed finding, where he stated (Appellant's App. 53):

> "Q. 55. And can you say whether or not that stretch which is put into that so-called 'pre-shrunk' material —I mean material made in accordance with the disclosure of this Cluett patent—does that remain in the shirt when it is folded up and sold?
>
> "A. Not after, when it is worn. Well, in other words, due to the type of machinery that we must use and every other shirt manufacturer must use, you must put that stretch in it, unless you would want to sew it individually by hand, which would be commercially impossible, and consequently if you are stretching out your goods an inch it stands to reason that when you give it a chance to go back, it is going to go back that inch.
>
> "Q. 56. Well, when you sell it, does it have any stretch?
>
> "A. It has got the stretch in it, not because we want to put it in, but because we don't know how to manufacture it any other way.
>
> "Q. 57. But it is there?
>
> "A. It is there.
>
> "Q. 58. And then after it has been sold and is laundered, does the shrinkage take up that stretch in one way or another?
>
> "A. Yes."

Appellant's Relyonsize process does not have this pronounced disadvantage since all the cutting and sewing operations are performed on the finished piece goods which does not stretch as does Sanforized goods when it is subjected to tension.

"18. The various operations necessary in the man-

> ufacture of garments such as shirts, may be more easily performed at lower cost when the fabric operated upon is in the condition in which it is received from the cloth finishing mill and in which it contains the usual sizing, than when it has been subjected to the Sanforizing process."

Mr. Mayer gave unrebutted testimony which adequately supports this proposed finding, particularly the following (Appellant's App. 55):

> "Q. 67. Are there other differences which affect the manufacturing operations, and I mean differences as between what we have been calling 'regular' material, and I mean by that, sized and finished material, and Sanforized material?
>
> "A. Well, I don't know. I thought I had covered it, the cutting and in the sewing and in the putting it through your folders, and your turning machines, where it costs you about twice as much, and those are the only differences that I can think of now. I may have forgotten some.
>
> "Q. 68. What is the result of those differences? Is the manufacture of the one shirt more or less expensive that the other, and how does it go?
>
> "A. It costs us a little bit more.
>
> "Q. 69. To what?
>
> "A. To manufacture it of pre-shrunk goods than it does ordinary goods."

> "23. The process of the Ainslie *et al.* patent No. 1,480,541 could not be employed in the manufacture of colored or printed shirts since it would be impossible to print the colors on the finished garment."

The record fully supports this proposed finding, since Mr. Mayer testified (Appellant's App. 65):

> "Q. 109. Could the process described in that patent be applied in the case of shirts or garments which are colored when finished?
>
> "A. No, it could not.
>
> "Q. 110. Will you explain briefly why not.

> "A. Well, for two reasons. In the first place, you cannot dye or bleach a shirt that has been colored, after it has been made up. You must have the dye or bleach or the printed matter on the shirt before it is manufactured, because there is no art or machinery that will dye or bleach or print shirts after they have been made up into the shape of a shirt as distinguished from a continuous band that a piece goods is made up in."

From the above, it is made clear that the process of the Ainslie *et al.* patent could be used only on uncolored, unprinted shirts, and for this reason, as well as many others, the Ainslie process would not be useful for the manufacture of shirts.

> "24. Complete shrinkage of the goods is not obtained by the process disclosed in the Ainslie *et al.* patent. As a result, further shrinkage will take place upon subsequent laundering of the collar or other article produced by this process."

It is clear from a consideration of the process described in the Ainslie *et al.* patent that complete natural shrinkage would not be obtained. This was stated by appellant's witness, Mr. Mayer, as follows (Appellant's App. 65, 66):

> "Q. 111. Does this Ainslie patent disclose any method or means for giving a garment in advance of its sale the precise dimensions which it will have after a succession of washings or launderings sufficient in number to eliminate the possibility of any further shrinkage?
>
> "A. It does not.
>
> "Q. 112. Why not?
>
> "A. Well, all the Ainslie patent describes is simply cutting some blanks, oversize patterns, and then dyeing and washing them, and the net result of that patent or of the process there would be simply to produce a garment that would have some of the sizing taken out, but without any relationship to further shrinkage.
>
> "Q. 113. Does the Ainslie patent take any account

> or make any references to shrinkage in more than one direction?
>
> "A. No, it does not."

With respect to shrinkage, the Ainslie patent is no closer to an anticipation of appellant's invention than was the practice of the housewife of cutting pieces for a garment slightly oversize.

> "25. The Ainslie *et al.* patent does not disclose a method by which a garment of precisely the desired dimensions could be produced."

The last above quoted testimony of Mr. Mayer shows clearly that the Ainslie patent taught merely that haphazard allowance for shrinkage might be made. No one reading this patent would obtain any different impression.

> "27. The text book 'Textiles and Clothing' suggests two alternative methods of making clothing. By the first method the cutting and sewing operations are necessarily performed upon the goods in the sleazy condition which it assumes after removal of at least a part of the sizing. By the second method the garment produced is initially oversize and will not shrink to the desired size until after it has been laundered. If the sample is washed but once, as prescribed, complete shrinkage will not be obtained, and, as a result, the garment, after having been laundered several times, will shrink more than the amount for which allowance was made."

This proposed finding is substantially a paraphrase of the pertinent portion of the text book and the more or less obvious facts deducible therefrom, as set forth in Mr. Mayer's testimony appearing in Appellant's Appendix, at pages 66 to 69. While the District Court may have refused to adopt this proposed finding because of its obvious character, the first of its Conclusions of Law belies such assumption. For in this conclusion, the Court held that all the method steps of the claims here involved were old or well-known or shown in this publication or in the Ainslie and Cluett patents.

> "28. The methods of making clothing suggested in the text book 'Textiles and Clothing' are not economically or practically usable in quantity production of shirts, where many thousands of shirts are manufactured in one lot."

This proposed finding is supported in every respect by the testimony appearing in Appellant's Appendix, pages 66 to 69. The process of the Watson text book may be of some use to the seamstress in making up a single garment or two. The proposals would not, however, be at all practical in the quantity manufacture of garments because there are problems in connection with the handling of thousands of yards of piece goods which are not present in handling a few yards of goods. In the testimony referred to, some of these difficulties were pointed out.

In its adopted finding No. 24 (Appellant's App. 208), the District Court materially broadened the admission of plaintiff-appellant's counsel relative to the use of wetting-out agents. The actual admission was as follows (Appellant's App. 33, 34):

> "The Court: Is there a claim made for that particular chemical?
>
> "Mr. Williams: I think none has that particular chemical, and that particular chemical is not new with us nor is the wetting out agent new with us. It is a chemical that is used in the dyeing operation."

Certainly the admission of appellant's counsel is limited and means only that wetting-out agents were not *per se* new with appellant. This is not an admission that wetting-out agents had ever been used to secure shrinkage.

In its finding No. 15, the District Court found (Appellant's App. 206):

> ". . . For the same reason that a Sanforized garment will increase in size on being laundered for the first time, plaintiff's shirt will also. In both, the fibres are held in crinkled condition by the sizing. . . . There appears to be no material difference between a shirt made of Sanforized cloth and the shirt made by plaintiff."

These quoted portions of finding No. 15 are absolutely contrary to the evidence, for, in carrying out appellant's process, the fabric of the finished shirt is completely shrunk naturally so that no further shrinkage will take place upon subsequent launderings (Appellant's App. 71); whereas, as previously pointed out, Cluett admits in his patent (Appellant's App. 93) that he produces a crinkling effect as a *substitute for* natural shrinkage, and that after the first laundering, the fabric will increase in size, and upon subsequent launderings will decrease in dimensions until ultimate natural shrinkage is obtained.

CONCLUSION.

It is respectfully submitted in conclusion that the invention of the "Relyonsize" process has materially advanced the progress of the useful arts and is an invention which was not obvious, but instead involved the exercise of the inventive genius.

It is further submitted that appellant's "Relyonsize" process as disclosed and claimed in the Mayer and Seyfarth application is not anticipated by the prior art of record, and that this Court should reverse the decision of the District Court and remand this case to the District Court for entry of a judgment adjudging that appellant is entitled, according to law, to receive a patent for said invention.

Respectfully,
Lynn A. Williams,
Benjamin F. Wupper,
2300 Board of Trade Building,
Chicago, Illinois;
James H. Littlehales,
867 National Press Building,
Washington, D. C.,
Counsel for Plaintiff-Appellant.